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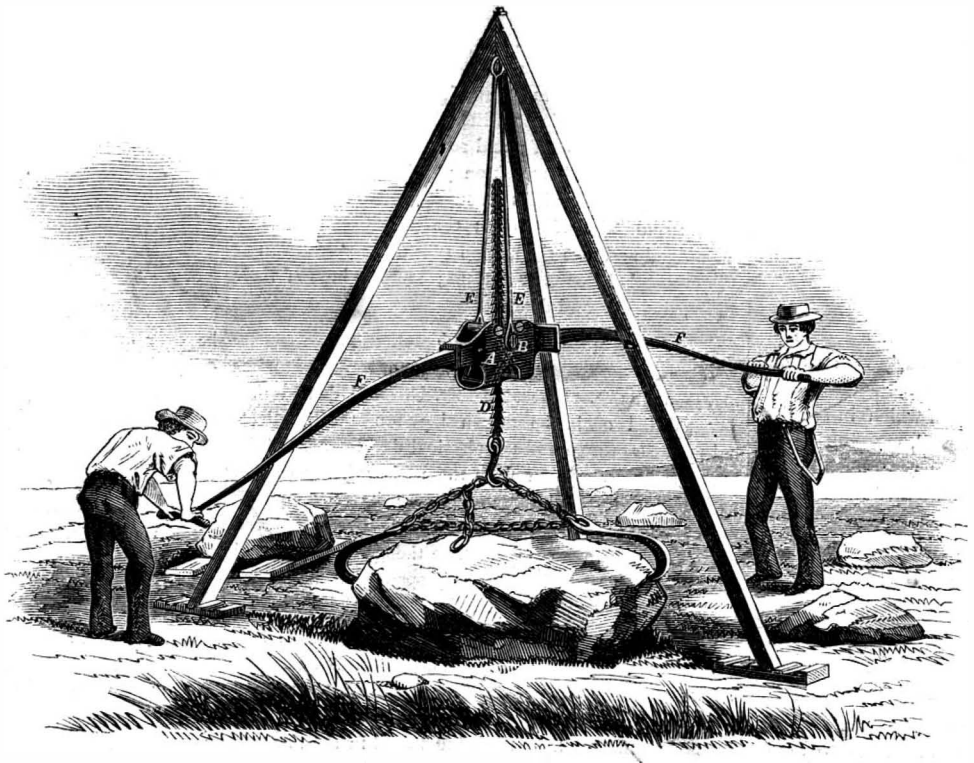
IMPROVED ROCK AND TUMP-LIFTER

We have heard the opinion expressed, by men well qualified to judge, that the farms of New England would not sell for enough altogether to pay for the labor that has been expended upon them in digging out stones. It is well known that this labor on one acre of a model farm in Massachusetts cost $3,000. Several rock and stump extractors have been invented, generally intended to work with a horse and windlass, but the one which we here illustrate is designed to be worked wholly by hand.

The stone or stump is secured by a chain to the lower end of a rack, D, and this rack is then carried up through a block, A, by means of two hooks, G G, working up and down, and alternately catching into the rack on either side, as shown clearly in Fig. 2; the block being suspended from the apex of a tripod or shears, as shown in Fig. 1. As the rack rises, a pawl catches under the teeth, and prevents it from descending. The hooks, G G, are connected by pivots to the long lever, F F, which permits a great multiplication of the power.

The inventor says:—"My machine is attracting great attention. I am permitted to refer to Alex. Holmes, Esq., President of the Old Colony and Fall River Railroad; Hon. Benjamin Rodman, of New Bedford (who has used it the most); C. F. Flint, Secretary of the Massachusetts Board of Agriculture; Mr. Howard, Editor of the Boston *Cultivator;* Hon. John Brooks of Princeton; and a host of others who have seen i work, that will testify to its superior practical usefulness The most comprehensive expression was from Capt. T J. Rodman, Chief of the Ordnance Department at the Watertown Arsenal; on witnessing its operation, he remarked that it was the most economical application of power he ever saw or heard of."

The patent for this invention was granted April 17, 1860, and further information in relation to it may be obtained by addressing the inventor, Caleb Bates, at Kingston, Mass.



BATES' ROCK AND STUMP EXTRACTOR.

SULPHUR IN RAIN.

Several weeks since, we received a letter from a correspondent residing at Amesbury, Mass., in which he stated that on the 18th of June last, after a heavy shower accompanied with thunder and lightning, the ground was found covered with sulphur. He inquired of us regarding the cause of this phenomenon, and we answered him on page 46 of the present volume of the SCIENTIFIC AMERICAN, stating that we could not account for it, although we have frequently heard of like instances taking place in various parts of the country. A correspondent—Mr. James N. Walters—writing to us from Prospect, N. Y., states that the same phenomenon was witnessed in that place at the same time, and considerable sulphur was also found on the ground and floating on the ponds. The first correspondent stated that he had burned some of the yellow powder, and that it emitted the smell and gave out the blue flame of common sulphur. Another correspondent—Mr. Wm. T. Brigham—writing to us from Boston on this topic, asserts that it was not sulphur at all which fell on the occasion, but the yellow *pollen* of the pine tree. He states that it is frequently found in summer after thunder-storms, in the form of a yellow powder, covering the ground and floating on the ponds, and that it is all imagination in persons who burn it to suppose it smells like sulphur. Professor Gray, at Cambridge, has oftentimes had this *vegetable sulphur* sent to him for examination; and, in every case, it has proved to be pine pollen. If examined under the microscope, it will be readily detected by its peculiar shape.

We have several times heard that this supposed sulphur was the yellow pollen of flowers, and we presume this is a perfectly true explanation of the phenomenon. During the high winds which frequently precede thunder-gusts, the pine pollen may be swept from the forests and carried to a considerable distance. The notion of sulphur being frequently deposited on the ground during thunder-storms is quite old. When the Rev. W. Clayton, rector of Crofton, at Wakefield, in Yorkshire (England), visited the colonies in 1688, he addressed a letter to the Royal Society from Virginia, on May 12th of that year, in which he stated:—"I have been told, by very serious planters, that 30 or 40 years ago, when the country was not so open as it is now, the thunder was more fierce; and sometimes, after violent thunder and rains, the roads would seem to be perfect coats of brimstone, and it is frequent, after much thunder and lightning, for the air to have a perfect sulphurous smell." The explanation which he gave of this phenomenon is as follows:—"I should here consider the nature of thunder, and compare it with some sulphurous spirits which I have drawn from coals that I could in no way condense, yet were inflammable, and would burn after passing through water."

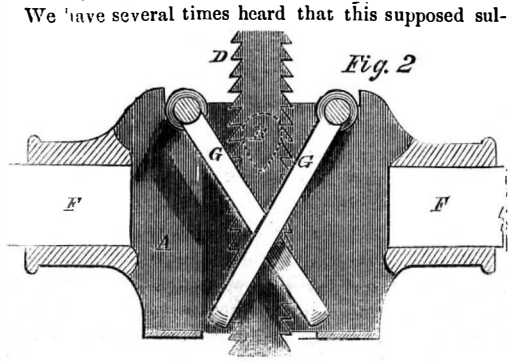


Fig. 2

In all probability, the sulphur then found in Virginia after thunder-showers was the pine pollen, which, undoubtedly, was very abundant when the country was thickly covered with the original forest. But it is also true that a sulphurous odor is frequently experienced during severe thunder-storms, and there is no way of accounting for this but by supposing it to be ozone created by the flashes of lightning passing through the atmosphere. Ozone is created, on a small scale, by electric sparks being passed through air confined in a vase; and upon the same principle it is prepared on a large scale in Nature's laboratory during thunder-storms.

MINOT'S LEDGE LIGHT-HOUSE.

The new light-house on the eastern coast is expected to be completely finished and lighted up on the first week of next month. The first blow struck upon the rock where this light-house has been erected was on the 12th of June, 1858. The old iron light-house was carried away by the fearful storm of April, 1851. During all the numerous and severe storms of last winter, the new light-house stood exposed to the merciless pelting of the waves of the wild Atlantic, without a stone or joint having been disturbed; this too, when the tower was at the hight of 60 feet in its most weak state. Having stood without damage in this naked and exposed condition, nothing can prevail against it when finished.

The diameter of the tower at its base is 30 feet, and at the floor of the lantern about 25 feet; the whole hight from base to top of lantern is 107 feet.

Workmen are now busy finishing the interior, and it will be lighted with one of the first order of "Fresnel lights." In strength it is said to rival the famous Eddystone light-house in the English Channel.

Two *savans*—Messrs. Deville and Debray—have recently melted large lumps of platinum. This has heretofore been considered an impossible feat.

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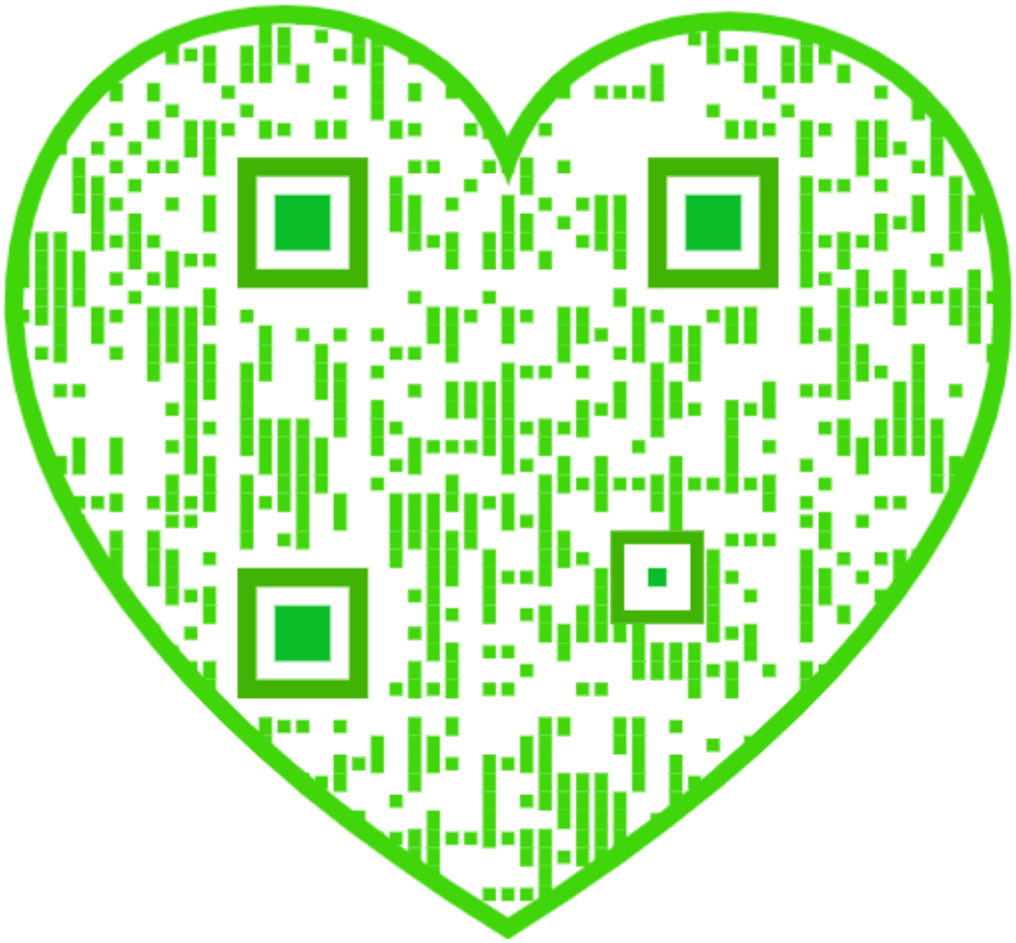

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Papers on Science from America.—Rev. P. P. Carpenter read a paper on the "Progress of Natural Science in the United States and Canada," in which he gave an explanation of the principles and working of the Smithsonian Institute at Washington, and some account of the contents and management of our State museums and scientific collections, to the authorities of which he awards high praise for liberality in their intercourse with European bodies, as well as for the excellence of their arrangements. Dr. McGowen, of New York, read a paper on the "History of the Anti-christian Settlement of the Jews in China." Professor Draper, of New York, read a notice on a "Reflecting Telescope for Celestial Photography, now erecting near Hastings, N. Y." Professor W. B. Rodgers, of Boston, read a paper on "Experiments and Conclusions on Binocular Vision." A letter was read on "Antartic Expeditions," from Capt. Maury, United States Navy, to Lord Wrottesley. Mr. E. Jarvis, of Boston, read a paper on the "System of Taxation prevailing in the United States." .Mr. J. F. Train, of Boston, read a paper descriptive of street railroads, as used in the United States. Col. Shaffner reported on the "Geography of the proposed Communication (telegraphic) between England and America, *via* the Faroes, Iceland, and Greenland."

Intellectual Development of Europe.—The paper which has perhaps called forth the greatest amount of keen and excited discussion was that of Professor Draper, of this city, on the intellectual development of Europe, considered with reference to the views lately propagated by Dr. Darwin. The object of this paper was to show that the advancement of man in civilization does not occur accidentally or in a fortuitous manner, but is determined by immutable law. The author introduced his subject by recalling proofs of the dominion of law in the three great lines of the manifestation of life. First, in the successive stages of development of every individual, from the earliest rudiment to maturity; secondly, in the numberless organic forms now living contemporaneously with us, and constituting the animal series; thirdly, in the orderly appearance of that grand succession which in the slow lapse of geological time has emerged, constituting the life of the earth, showing therefrom not only the evidences, but also proofs of the dominion of law over the world of life. In those three lines of life he established that the general principle is to differentiate instinct from automatism, and then to differentiate intelligence from instinct. In man himself, three distinct instrumental mechanisms exist, and three distinct modes of life are perceptible—the automatic, the instinctive, the intelligent. They occur in an epochal order, from infancy through childhood to the more perfect state. Such holding good for the individual, it was then affirmed that it is physiologically impossible to separate the individual from the race, and that what holds good for the one holds good for the other, too; and hence that man is the archetype of society, and individual development the model of social progress, and that both are under the control of immutable law; that a parallel exists between individual and national life in this, that the production, life, and death of an organic particle in the person answers to the production, life and death of a person in the nation. Turning from these purely physiological considerations to historical proof, and selecting the only European nation which thus far has offered a complete and completed intellectual life, Professor Draper showed that the characteristics of Greek mental development answer perfectly to those of individual life, presenting philosophically five well marked ages or periods—the first being closed by the opening of Egypt to the Ionians; the second, including the Ionian Pythagorean, and Eleatic philosophies, was ended by the criticisms of the sophists; the third embracing the Socratic and Platonic philosophies, was ended by the doubts of the sceptics; the fourth, ushered in by the Macedonian expedition, and adorned by the splendid achievements of the Alexandrian school, degenerated into Neoplatonism and imbecility in the fifth, to which the hand of Rome put an end. From the solutions of the four great problems of Greek philosophy, given in each of these five stages of its life, he showed that it is possible to determine the law of the variation of Greek opinion, and to establish its analogy with that of the variation of opinion in individual life. Next, passing to the consideration of Europe in the aggregate, Professor Draper showed that it has already in part repeated these phases in its intellectual life. Its first period closes with the spread of the power of republican Rome, the second with the foundation of Constantinople, the third with the Turkish invasion of Europe: we are living in the fourth. Detailed proofs of the correspondence of these periods to those of Greek life, and through them to those of individual life, are given in a work now printing by the author in America. Having established this conclusion, Professor Draper next briefly alluded to many collateral problems or inquiries. He showed that the advances of men are due to external and not to interior influences, and that in this respect a nation is like a seed, which can only develop when the conditions are favorable, and then only in a definite way; that the time for psychical change corresponds with that for physical, and that a nation cannot advance except its material condition be touched—this having been the case throughout all Europe, as is manifested by the diminution of the blue-eyed races thereof; that all organisms and even man are dependent for their characteristics, continuance and life, on the physical conditions under which they live; that the existing apparent invariability presented by the world of organizations is the direct consequence of the physical equilibrium, but that if that should suffer modification, in an instant the fanciful doctrine of the immutability of species would be brought to its proper value. The organic world appears to be in repose because natural influences have reached an equilibrium. A marble may remain motionless for ever on a level table, but let the table be a little inclined, and the marble will quickly run off; and so it is with organisms in the world. From his work on physiology, published in 1856, he gave his views in support of the doctrine of the transmutation of species; the transitional forms of the animal and also the human type; the production of new ethnical elements or nations; and the laws of their origin, duration and death.

DISCUSSION.

The announcement of the above paper attracted an immense audience. The Rev. Mr. Creswell denied that any parallel could be drawn between the intellectual progress of man and the physical development of the lower animals. So far from the author being correct with regard to the history of Greece, its master-pieces in literature—the Iliad and Odyssey—were produced during its national infancy. The theory of intellectual development proposed was directly opposed to the known facts of the history of man.

The next speaker was Sir B. Brodie, who stated that he could not subscribe to the hypothesis of Dr. Darwin. His primordial germ had not been demonstrated to have existed. Man had a power of self-consciousness—a principle differing from anything found in the material world, and he did not see how this could originate in lower organisms. This power of man was identical with the divine intelligence; and to suppose that this could originate with matter involved the absurdity of supposing the source of divine power dependent on the arrangement of matter.

The learned and venerable Bishop of Oxford stated that the Darwinian theory, when tried by the principles of inductive science, broke down. The facts brought forward did not warrant the theory. The permanence of specific form was a fact confirmed by all observation. The remains of animals, plants and man found in those earliest records of the human race—the Egyptian catacombs—all spoke of their identity with existing forms, and of the irresistible tendency of organized beings to assume an unalterable character. The line between man and the lower animals was distinct; there was no tendency on the part of the lower animals to become the self-conscious, intelligent being, man; or in man to degenerate and lose the high characteristics of his mind and intelligence. All experiments had failed to show any tendency in one animal to assume the form of the other.

Dr. Hooker, the celebrated botanist, having been called upon for his views, said that they accorded with those of Mr. Darwin, and that the Bishop of Oxford did not understand them. Mr. Darwin seems to have set the scientific world by the ears; it is no easy thing to arrive at what he does mean in many cases.

AN IMPROVEMENT NEEDED IN SUGAR-CANE MILLS.

MESSRS. EDITORS:—Regarding sugar-cane mills for pressing cane, I think something new must be got for that purpose, cheap and more economical than anything yet existing, so as to suit small farmers who are raising their own sweetening upon their own farms for their own family use—and there are many such since the Chinese sugar cane has been introduced into the United States. I wish it understood that, were it possible to obtain all the juice of the sugar cane, there would be a yield of from 87½ to 90 per cent of liquid; that is, from 100 lbs. of cane stalks, there would be a yield of from 87½ to 90 lbs. of juice extracted, a result, never, perhaps, to be attained. But it must be lamented that, upon an average with all the mills in use, fully one-third of the whole quantity of juice is left remaining in the cane after it has passed through the mill, which is all lost, or worse than lost, as the "bagasse" (as the pressed cane is called) makes good fuel when dry, and is generally used for that purpose. The best horizontal iron roll mills, driven by powerful steam engines, yield from 70 to 75 per cent only of the juice; while the more imperfect grinding often reduces it below 50 per cent, which is a shameful waste. As an improvement, I would suggest that one of the rollers of the mill, as mills exist at present, should be covered with a length of thin india-rubber tubing, so as to render the two last rollers absolutely close on one another, so that when the cane was passing through the mill, each piece would have the appearance of coming through a hole—that is, the cane, to a certain extent, would seem imbedded in the rubber that covered the solid hard roller, and no juice could then follow the rolls as they turn round to be absorbed by the spongy bagasse, as at present. I am of the opinion that the cane, as a general thing, is sufficiently pressed in going through the mill, but the absorbing nature of the pith drinks back a portion of the liquid the moment the cane is released of its pressure and when still between the rollers, before it can be observed by the closest watching. The rubber which I propose need not be over one-eighth of an inch in thickness, and only one roller need be covered with it (whether of wood or iron), and there would be no use in passing the cane more than once through the mill. J. T.

Wayne Center, Ill., August 6, 1860.

A PERNICIOUS DENTIFRICE.

MESSRS. EDITORS:—A few weeks ago you published an extract from the *Dental Cosmos*, in which article "soap" is recommended as "the great dentifrice to be used at all times and under all circumstances." In the same number of the *Dental Cosmos*, Dr. J. D. W. (whose views are seldom wrong) says that soap should *not* be used under all circumstances; and many other writers object to it entirely. I have given much attention to dentifrice, during a practice of about 16 years; and I am very sure that soap is *injurious* in a majority of cases.

As soap is a very common domestic article, it is very likely to be used to an abusive extent—particularly when recommended by so high an authority as the *Dental Cosmos* and endorsed by the SCIENTIFIC AMERICAN. I hope, therefore, that you will have the kindness to lay this variety of opinions before your many readers, and endeavor to dissuade them from the general use of soap as a dentifrice. A. H. T.

Lambertville, N. J., August 6, 1860.

THE MAGNETIC PROPERTIES OF IRON.

MESSRS. EDITORS:—It is well known that if a piece of iron wire is twisted it acquires magnetism; and if freely suspended, it points to the magnetic poles, and attracts iron filings or small pieces of iron. If a piece of iron that may be readily filed is put in contact with a powerful magnet, great difficulty will be felt in filing it when in this position. We must suppose that the particles of iron undergo some change in those experiments. The strength of iron under such circumstances should be tested; and trials should be made to ascertain whether magnetism is induced in twisted gun barrels, and whether such condition adds to their strength. Magnetism may be induced in a gun barrel by a helix of copper wire wound round it, through which wire a current of electricity is passing. Let its strength in this condition be compared with a similar barrel under ordinary circumstances. T. B. WHITE.

New York, August 4, 1860.

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THE HARBOR OF NEW YORK.

[Continued from page 83.]

In order that we might not be amenable to the charge of attaching too much importance to this subject, we submit a few of the results of investigations held by the Tidal Harbors Commission, in England, together with the opinions of the necessity of maintenance of the tidal volume in *all maritime ports*, as furnished by Calver (in his very valuable work upon tidal rivers), whose *thesis* is that "the navigable condition of the outlet of a tidal river can only be maintained by tidal water, and that its extent as to sectional capacity, will be proportioned to the amount admitted."

We consider the magnitude of every tide harbor, both as to width and depth, is generally proportionate to the quantity of such flowing and reflowing water, and every subtraction from such quantity by embankment, tends to decrease the magnitude of the outlet to the harbor. —*Rennie & Jessop in Report on Rye Harbor;* 1801.

I am not aware that any remedy can be substituted for the deprivation of back-water.—*Rennie in Report on Southwold Harbor;* 1820.

It is not to be forgotten that as the sands and mud accumulate and marsh lands are formed in the upper part of the estuary, the power of scouring the lower portions (the entrance) is diminished.—*Telford in Report on River Dee;* 1821.

If there were no receptacle for tidal waters to pass in and out at every tide, the harbor would cease to exist. * * * * If with the same width between the piers, we reduce the quantity of water which has to pass in and out at the same time, we diminish at once the required velocity or power to remove obstructions, and a decrease of depth follows almost immediately. * * * * It is to be lamented that when the owners of estates were, perhaps, balancing in their minds whether the land they could reclaim would pay the expenses for reclaiming it, they were not advised of the injury they were about to do to the public and themselves by the reduction of the back-water upon which their harbor is dependent.—*Walker in Report on Southwold Harbor;* 1841.

Liverpool, Yarmouth, Montrose, and many of our great harbors, depend for their existence upon the tidal current, and therefore the receptacle for tidal water ought to be preserved with jealous care.—*Walker in Report on the River Tay;* 1845.

Question: Are the Commission to understand that inclosures stopping the flow of tidal water must gradually injure the bar of the harbor to which that formerly served as a scour?

Answer: Yes, it will do so. [*Cubitt in Evidence before Tidal Harbors Commission;* 1845.]

I think that any effect from a fresh at the bar is a mere bagatelle compared with the scouring of tidal water.—*Leslie in Evidence before Tidal Harbors Commission;* 1845.

Question: Are you of opinion that depths in rivers and their power of scouring are chiefly due to the volume of water brought down in freshes, or to the tidal waters?

Answer: I should say to the tidal waters. [*D. Stevenson in Evidence before the Tidal Harbors Commission;* 1845.]

Rye Harbor has been ruined by embankments; it appears in evidence that formerly a sixty-four-gun ship could use that harbor, which is now ruined.—*Rennie in Evidence before the Rochester Bridge Committee;* 1820.

Blackney and Clay, on the northeast of Norfolk, have a common entrance from the sea; within the memory of some of the present pilots one hundred and forty coasting vessels have taken refuge in this port during one tide, yet in the place where these vessels lay afloat, at low water, there is now only a depth of four or five feet, and the utility of the harbor has consequently been almost destroyed. It is stated that this evil has been caused by the inclosure, at different times, of more than one thousand two hundred acres of land, over which the tidal waters formerly flowed.—*Second Report of Tidal Harbors Commission;* 1846.

The area of the estuary of the Dee was formerly about 12,000 acres, covered at every spring tide; of this space, 8,000 acres have been inclosed, and the tidal water excluded. The act of Parliament that sanctioned this extensive encroachment required that a depth of fifteen feet, at ordinary spring tides, should be maintained up to Chester; but the river was in so bad a state in December, 1844, that a vessel drawing only eight and a half feet water could not go up to Chester on a spring tide. At Parksgate, twelve miles below Chester, which formerly was one or the principal mail packet stations between England and Ireland, a dry sand now extends almost across the estuary.—*Second Report of Tidal Harbors Commission;* 1846.

Mr. Walker, in evidence before the Tidal Harbors Commission, states that "the diminishing the reservoir for the tidal water in the Thames has had, in my opinion, the effect of increasing the shoal at its mouth."

Mr. Abernethy, in his report upon the Dee (the enormous obstructions from which river we have already noticed), remarks that "the lower portion of the navigation is gradually filling up;" thus proving the correctness of Telford's prediction.

The preceding testimony tends to dissipate the fatal error of a common and generally-conceded opinion, that the flow of water from the Hudson river, by freshets, is all-sufficient to keep the bar at Sandy Hook navigable.

In the Tay, the discharge, including that of the Earn, amounts, during freshets, to one million of cubic feet per minute, or two hundred and forty millions of cubic feet during four hours. The tidal water passing Dundee, in the same time, is above seven thousand millions, or thirty times that of the river water; and making the calculation at the bar, the tidal water is upward of forty times that of the river water. It is only when the quantities are reduced to figures, in this way, that the vast disparity is seen; and Mr. Leslie says that "any effect from a freshet at the bar is a mere *bagatelle* compared with the scouring of the tidal water." Now, if this text of a measurement of the proportionate flow of the tide and of the freshets was made in the Hudson or Delaware, or any of our tidal rivers of magnitude, a much greater disparity would be found to exist; for in this country, where the annual fall of rains is much below that of England, the volume of the river freshets would naturally be proportionally decreased, which freshets, when estimated in connection with the *datum* of those above-cited, would be conclusive as to the inefficiency of the scouring of a freshet in comparison with that of the flow of the tides.

As regards the effect of the presence of ice in a harbor, it must not be lost sight of that, although ice in suspension in the water does not reduce the tidal volume, other than by presenting a resistance to the surface current of the tidal flow, yet that when it is fixed, as when upon "flats" and shores, it reduces the tidal volume in direct proportion with its own.

Trusting that the results furnished, and the many and important views herein given, will meet with the hearty approbation of the readers of the SCIENTIFIC AMERICAN and a concurrence in the opinion as to the importance of the subject, we conclude by submitting the following query:—"If the merchants of Boston and other tidal ports are alarmed regarding *their* harbors, 'possessing, through the great rise and fall of tide, great tidal volume, the essential element of preservation of depth,' what excuse can be offered by the merchants of New York for their total and reckless neglect of all action having in view the preservation of *their* harbor—one of the most magnificent in the world—and the maintenance of the requisite depth of water on the bar at Sandy Hook?" We pause for an answer.

[Concluded.]

COMPENSATING PENDULUMS.

MESSRS. EDITORS:—On page 36 of the present volume of the SCIENTIFIC AMERICAN, Mr. Henry Giles gave a description of a compensating pendulum, which, at first glance, appears to be perfect; but I think it can be satisfactorily shown that it is not as good as a simple wooden rod, straight-grained, well-seasoned, and varnished to protect it from moisture. In the one he describes, the brass rod in the back of the case rests at the bottom on a support fixed firmly to the wooden case, and the brass piece through which the pendulum spring passes at the top is also fixed to the same board. Now, it is evident that the real vibrating length of the pendulum is regulated by the distance between these two pieces, since whatever expansion the pendulum rod may have is carried above the upper one by a corresponding expansion of the rod in the back of the case, and *vice versa*. The distance between these points is subject to all the variations of the board to which they are fixed, and this board may be cross-grained, and is seldom, if ever, protected by varnish or otherwise from the moisture of the atmosphere. Would it not be much easier to find and prepare a wooden rod which would be perfectly straight-grained, &c., than to find these qualities in a board wide enough and thick enough for the back of a clock case? In regard to a wooden rod, although it is much better than an ordinary metallic one, yet we have the testimony of the most eminent artists in that line, that it will not answer where a complete compensation is required. If I am wrong in my ideas, I wish to be enlightened, as I am practically interested in the subject.

O. D. BEMAN.

Harpersville, N. Y., July 24, 1860.

SILVER'S "MARINE GOVERNOR" CONTROVERSY.

Silver's "marine governor"—illustrated on page 356, Vol. XI (old series), SCIENTIFIC AMERICAN—consists of a pair of rotating pendulums, each suspended by its center of gravity from a common axis to which are attached springs that exert a tendency to keep them parallel. When the pendulums are made to rotate, they diverge from the axis until the centrifugal force balances the statical one exerted by the springs. As its action is independent of the direction of its axis and of the force of gravity, it is eminently adapted for steam engines on ships, which are subject to violent motions.

There has been quite a controversy maintained in several of the London periodicals, lately, about the above-mentioned governor, and another one for which a patent had been solicited by Mr. J. Meriton. Those interested in Mr. Silver's British patent resisted the issuing of one to Mr. Meriton, on the ground that it was a modified form of the same invention. The Commissioners of Patents refused the issue of the new patent, hence the controversy in the newspapers on the subject. This is our understanding of the case, as derived from our exchanges. One side contends that Meriton's improvement is different from Silver's invention, and that a patent was unjustly refused for it; the other side contends that Meriton's claimed improvement is similar to making the hammer of a musket strike upward instead of downward, and calling that a different invention and improvement. This discussion has, however, drawn out a fact before unknown to us, namely, that the great Brunel invented a marine (spring) governor, with double balls and crossed arms, several years ago, but it never came into general use. The reason is not stated, although the device appears to have been capable of doing good service.

PRACTICAL TEST OF A GOOD VALVE.

MESSRS. EDITORS:—In your issue of July 21st, I notice a communication from "C. R.," on the working of steam engines, which leads me to give my experience. I agree with him in regard to cutting-off, but think that end best practically obtained on ordinary high-pressure engines by the link motion or its equivalent. He speaks of the openings for the admission and escape of steam being too small, and of the friction, owing to the enormous pressure when the openings are of sufficient size. I agree exactly with him and must give him my experience with an engine having a valve overcoming all these objections to the ordinary slide valve, known as "Michener's balanced valve." It is a circular valve having a hollow stem extending through the steam-chest cap, and an arm on that stem to oscillate it. The steam passes into the steam chest and out through this hollow stem. The engine on which I have used it is 7½ inches bore and 15 inches stroke; and this valve gives an induction opening of ⅜ by 15 inches long, and an escape opening ¾ by 15 inches. The throw of the valve is about 2¼ inches. The engine was started in March, 1858, and for eight months after it was started I engineered it without the least trouble. Up to this date the valves (one on each end of the cylinder) have never been removed nor the packing yarn in the stuffing box renewed. The pressure on the valve is so slight that, when sawing, I can take hold of the driving arm on the valve and raise it up off its seat.

The engine is attached to the saw shaft and runs at the same speed as the saw, averaging about 350 revolutions per minute. I have seen it attain a speed of 700 revolutions per minute. Three ordinary hands sawed 28,000 feet of poplar in 5 days (of 10 hours), using nothing, for fuel, but sawdust as it was made from the logs. The average pressure of steam in the boiler did not exceed 50 lbs. I am confident that the same engine, attached to a circular mill, will double the amount with the same pressure of steam. Is not that better than can be done with an unbalanced-valve engine of the same size?

A. D.

New York, Aug. 6, 1860.

CANADIAN INDUSTRIAL EXHIBITION.—The next annual agricultural exhibition in Canada will be held at Hamilton, C. W., commencing in the early part of next month. About $15,000 in value will be awarded in prizes. The Prince of Wales is to be present.

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POPULAR ERRORS ABOUT FRICTION.

It is seldom that the path to truth lies through error; yet probably many more have been led astray by the truism that "friction is independent of velocity" than would have been by the incorrect statement that "friction varies directly as velocity." The popular error on this point arises from confounding *force* with *power*—two entirely distinct ideas. A simple illustration will render the whole subject clear.

Suppose an iron sledge, without wheels, weighing 1,000 pounds, resting upon a railroad track, to be directly attached to the piston rod of a cylinder having an indefinite length. Let the area of the piston be 10 square inches. Experiment shows that when dry iron rubs on dry iron, every 1,000 lbs. weight requires a force of 150 lbs. to keep it in motion. Admit into the cylinder steam having a tension exceeding 15 lbs. per square inch; the pressure on the piston now exceeds 150 lbs. (the resisting force of the friction of the sledge), and the latter will begin to move with an increasing velocity. When the velocity of two feet per second is obtained, reduce the tension of the steam to just 15 lbs. per square inch, and the pressure on the piston just equaling the resistance arising from friction, the sledge will continue to move with a uniform velocity of two feet per second. The *force* constantly acting will be the pressure on the piston of 155 lbs.; the *power* expended per second will be 150 lbs. moved 2 feet or 150 × 2=300 "feet-pounds" per second, corresponding to a consumption of 10 × 2 × 12 = 240 cubic inches of steam of 15 lbs. tension. Next increase the tension of the steam; this will cause an increase of velocity of the piston and sledge. When the velocity reaches four feet per second, again reduce the tension of the steam to 15 lbs. per square inch; the pressure of the steam on the piston then just equals the resistance arising from friction, and the sledge will continue to move with an uniform volocity of four feet per second. In this case the *force* constantly acting will be the pressure on the piston of 150 lbs.; the *power* expended per second will be 150 lbs. moved four feet, or 150 × 4 = 600 feet-pounds, correspond ing to a consumption of 10 × 4 × 12 = 480 cubic inches of steam of 15 lbs. tension.

Now, compare the two cases. While the *velocity* is doubled, the *force* remains constant, but the *power* expended per second is doubled. Thus, it is evident that, while the resisting *force* exercised by friction is independent of velocity, the *power* requisite per second to overcome the resisting force of friction varies directly as the velocity. As, however, when the velocity is doubled, the time required to pass over a given space is reduced to one half, we have for the passage over any given *space* a double power exercised during a halved time; the increase of power just canceling the diminution of time. This is true for all variations of velocity; hence, though the power expended *per second* in overcoming friction varies directly as the velocity, the power expended in overcoming friction for any definite *space* is independent of the velocity.

As a general rule, then, in determining the cost of transportation from one place to another, so far as friction alone is concerned, we can neglect the velocity; but in determining the power requisite to drive machinery, we must regard the power necessary to overcome friction as varying directly with the velocity.

SAUSAGE-CUTTER AND FILLER.

"Killing hogs" is a job which has to be performed yearly in the early winter among our farmers, and a principal portion of the labor connected with it is the chopping of the sausage meat. Some farmers have heavy blocks prepared, with a slight hollow formed in them, and chop the meat on these with either a broad-ax or cleaver. But our inventors are changing the method of doing this, as they are of doing almost everything else, by devising easier and more rapid processes. A large number of machines for cutting sausage-meat have been invented, and we here present an illustration of the very last one which has made its appearance before the public.

This machine is designed to cut the meat and to force it into the skin. A series of cutters, of the form represented at B (Fig. 2), are fastened upon a shaft, A, with a space between them about equal to the thickness of a cutter; rings or washers, c, being employed to separate them. They are so placed upon the shaft that the two hooked edges form spiral grooves around the shaft, and they revolve between fixed cutters, I, permanently secured in the concave case of the machine. The cutters have two cutting edges, as shown, and there are two series of stationary cutters, the edges of one being turned down and the other up, so that the meat is subjected to two cutting operations at each rotation of the shaft. The spiral form of the grooves causes the meat to be forced along from right to left and so discharged from the nozzle of the machine; this lateral movement being still further promoted by the propeller form of the two end pieces upon the shaft. A tin nozzle of proper length is secured to the discharging orifice by means of the ring F (Fig. 3) and screw, so that it may be removed when it is not desired to stuff the meat into skins.

The patent for this invention was granted (through the Scientific American Patent Agency) on July 24, 1860; and further information in relation to it may be obtained by addressing the inventor, Louis Bonnet, at No. 78 Leonard-street, this city.

Fig. 1

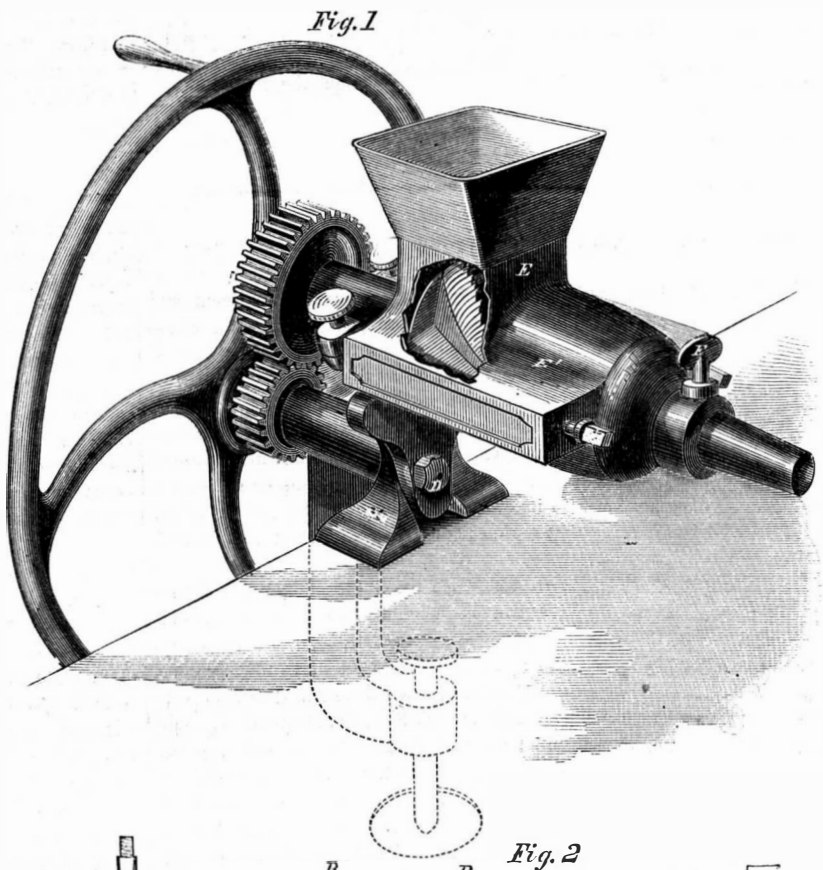

Fig. 2

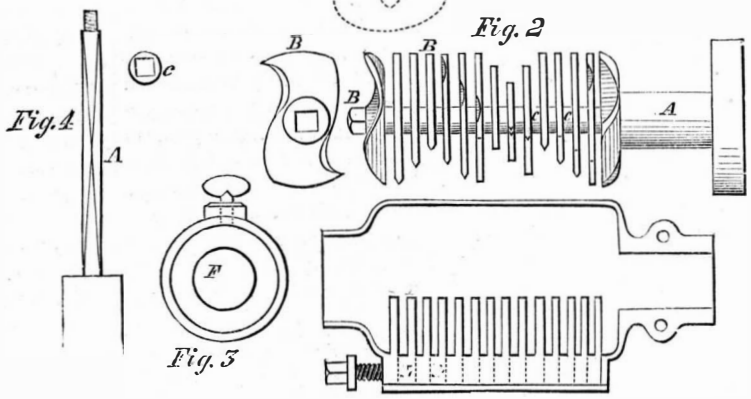

Fig. 4

Fig. 3

BONNET'S PATENT SAUSAGE-CUTTER AND FILLER.

GAS TO REPLACE STEAM AS A MOTIVE POWER.

The Paris correspondent of the Boston *Traveler* sends the following account of the new invention (by a Frenchman) of a gas engine, which is now exciting considerable attention in the French metropolis:—

"I believe the machine recently invented by Mons. Denois (a gentleman quite well known by his galvano-plastic copies of alto-relievo sculpture and engraving), I mean his gas engine, which he looks upon as destined to take the place of the steam engine in a great many places where a motive power is required, occupies the chief share of the Academy's attention at this present moment. This gas engine is a good deal like the steam engine in its external appearance. There is the same cylinder with its piston, the same fly-wheel, eccentric and slide-box—but no boiler and no furnace. It has a gas meter and a very small inductive apparatus. There is a tube leading from the gas meter, and conductors leading from the electrical apparatus to the cylinder, or rather to the organs of distribution which immediately precede the cylinder. When the gas enters the slide-box it is mixed with a large proportion of ordinary air, introduced first on one and then on the other side of the piston, and there it meets an electric spark which fires it; the moment this takes place, the aperture through which the gas enters is closed, so that the combustion takes place in a sealed chamber and determines in the mixed gas and air a force of expansion which acts immediately upon the surface of the piston. The motion of the slide-box and electric distributor is so arranged that the moments of introduction, inflammation and expulsion take place in succession and at proper times. When the piston has its motion in one direction, the same phases of the introduction and combustion of the gaseous mixture take place at the other extremity of the cylinder. This machine is 30 per cent more economical than the steam engine, and it only costs $200. and can be used wherever gas is used. I call the attention of your mechanics to it, if they ever stand in need of small motive power. It is cheap, it is convenient, and a it isfree from danger."

[Whatever credit belongs to the above-described invention, France deserves no share in it. Such an engine was exhibited for nearly a year, in full operation, in the Crystal Palace, in this city, in 1855. A full description of it will be found on page 93, Vol. XI. (old series), of the SCIENTIFIC AMERICAN. Its inventor was Dr. Drake, of Philadelphia, now deceased, a very enthusiastic and worthy American inventor. Such an engine possesses inherent defects, and never can supersede the steam motor.—EDS.

THE sewing machine case recently on trial at Cooperstown, N. Y., before Judges Nelson and Smalley, between the Wheeler & Wilson Sewing Machine Co., and G. B. Sloat, on the feed and looping device, had not been decided at the time of our going to press. As soon as we get the decision we shall publish it.

CANNEL coal should be used exclusively for making gas, as it contains little or no sulphur.

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IMPROVED SOLDERING-IRON.

It has been said that a good mechanic can at any time be known by the good quality and condition of his tools, and it certainly is impossible to turn out a large amount of good work with poor tools or with those in bad condition. We respectfully call the attention of all plumbers and tinsmiths to the neat and convenient soldering-iron here illustrated. It is so clearly shown in the cut as hardly to require description.

The heater, A, is made of cast iron, cast upon the wrought iron rod, S, which secures it to the handle, C. The copper shoe, B, is held upon the heater, A, by means of the wire, J, in the length of which is the

Fig. 1

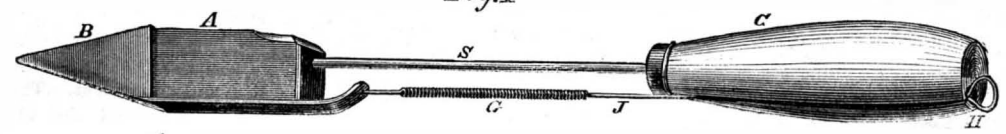
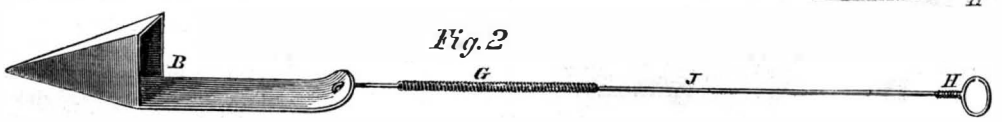


Fig. 2



PATEE'S IMPROVED SOLDERING-IRON.

spiral spring, G. A slit, E, is made in the handle for the wire, J, and a recess in the end of the handle, for the ring, H; so that both may be out of the way when the tool is in use. By drawing the ring, H, back, the wire, J, is readily slipped from the handle, permitting the heater to be drawn from the shoe, to be reheated. It is designed, in shops where the work is constant, to have two heaters for each shoe. This soldering-iron is very cheap, and it certainly seems to be as neat and convenient as it is possible to imagine one to be made. An important advantage—perhaps the greatest one claimed for it—is in the fact that, from being capable of being heated in any kind of fire, without injuring the face of the iron, it is adapted for general use in families, especially in the country, where tinmen are not usually within reach.

This soldering-iron was invented by Lester Patee, who has assigned the invention to himself and Abram H. Ryan, and the patent was granted on the 3d of July, 1860, to these two parties, either of whom may be addressed at Peoria, Ill., for further information in relation to it.

WHO ARE OUR GREAT MEN?

We extract the following article from a sprightly journal called the *Hydraulic Press*, published in North San Juan, Cal. It forcibly sets forth some plain truths which are too often lost sight of by the multitude:—

Lately having nothing else to do, we have been pouring over a few of the last volumes of the SCIENTIFIC AMERICAN, that excellent exponent of mechanical philosophy; and we have come to the conclusion—mauger the world's fashionable sanctions and traditions—that our really "great" men are those who have done most to explore and unveil the laws of nature and have labored to make the knowledge of those laws subservient to human happiness. In our estimation, the scientific mechanician, who discovers a means of lightening the toil of human muscles, by harnessing the uncomplaining elements and making them work, while the toiler can have leisure to rest and think, is the truly great man. He is the true benefactor of his race, the true motor and upbearer of civilization.

There was a time—and more's the pity that that time has not quite gone by—when human greatness was measured and weighed by human blood and human corpses. A man in order to become "great" in the world's appreciation, was compelled to show himself *a great murderer*. The greater the number of his battle-fields, the greater the number of his slaughtered victims, the greater the number of cities he destroyed and the lands he devastated, the greater he stood, as a man; and the historian and the poet vied with each other in chronicling his fame and singing *peans* to his glory. Strange perversity of the human heart, that it should exalt the destroyers of mankind while it passes by the benefactors of the race in silence and contempt. The patient geniuses, who built the grand cities of the world, rendering them abodes of peace, while they embellished them with the triumphs of architectural skill and the glories of sculpture, have been strangely forgotten in history and song; while the monsters who transformed those cities into masses of crumbling ruins are the pets for the annalist and the most brilliant of themes for the lyrist.

The politicians claim high niches in the world's temple of fame. And yet, what have politicians done in the cause of civilization and social order? Why, the man who perfected the steam engine and the man who applied it to the purpose of navigation have done more for human enlightenment and human progress than all the politicians that ever lived. Who caused the vast valley of the Mississippi to team with intelligent and virtuous humanity? Not the politicians. The steam engine and the steamboat—the ingenious creations of Watt and Fulton—have been the great motive agents that have worked such miracles of progress, not alone in the valley of the Mississippi, but in California, and in all the American republic. The man who invented the sewing machine bestowed a boon upon the world, greater in its consequence than all the grandiloquent harangues and pretentious civic reforms of a million of politicians.

In our own California—and especially in this very quarter of it—who unveiled the secret of tearing from the bowels of our gravel ridges their long-hidden hoards of treasure? Not a conquering warrior—not a priest—not a politician. No; it was Edward E. Mattison, who first discovered and successfully applied hydraulics in gold mining, thereby bringing to the light and adding to the world's wealth millions of dollars that would otherwise have slept, in silence and darkness, to the "crack of doom;" he was, and is nothing more or less than an honest, unpretending mechanical inventor, who thought so little of his achievement that he never took the trouble to ask a patent for it. All the politicians that have risen, and reigned, and reveled in California—governors, senators and assemblymen, with all their pompous pretentions—have never rendered a tithe of benefit to the State which it has derived from the simple hose and pipe of our unobtrusively-ingenious friend, Mattison.

This article, in its commencement, was intended as a brief compliment to the utilitarian excellence of the SCIENTIFIC AMERICAN; but, somehow, it has run slightly beyond its chalk-marks. Nevertheless, there is still room for saying that the SCIENTIFIC AMERICAN is a periodical that ought to be found in all the parlors, the libraries, and the workshops of the republic; being, as it is, a cheap but ever-intelligent and entertaining compendium of all that is useful in the arts and magnificent in science.

THE IMPROVED TELEGRAPH CABLE AN AMERICAN INVENTION.

MESSRS. EDITORS:—I noticed in one of the late numbers of your paper that a Mr. Clark, of London, *lately* took out a patent for "a peculiar manner of forming telegraphic wires, so as to make the current flow in the center and prevent its dissipation by flowing off at the surface. He employs silver, which is the best conductor, for the central wire, and on this is an outside casing of copper."

Immediately after the laying of the Atlantic cable I wrote an article on "The Atlantic Telegraph," which was then published in the *Ruralist*, of Springfield, Ohio, in which I used the following words, which will at once show my claim to the priority of the discovery:—"We will venture the opinion that had the present Atlantic cable a silver central wire, surrounded by six copper strands, there would be less said about the 'swell' and the feebleness of the signals, and such ominous expressions. We claim in favor of the silver strand its superior electrical-conducting powers. It has nearly one-half more power of conducting galvanic electricity than copper. But, in this experiment, their combination would cause a compromise between the two; the conducting properties of the copper would be improved and those of the silver diminished, leaving, however, to the silver a centralization and concentration of the electrical fluid in its passage. The expense of the silver strand would not be a great objection, as one almost of the greatest attenuation would answer the purpose."

G. P. HACHENBERG, M. D.

Coxsackie, N. Y., July 27, 1860.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

The fourteenth annual session of this association commenced in the State House, at Newport, R. I., on the 1st inst. The association was called to order by Professor Hitchcock, who introdueed Dr. Isaac Lea, of Philadelphia, as president-elect, who took the chair and made an appropriate address for the occasion.

It has been the custom of the association to divide into sections for discussing different subjects; this year it was wisely determined to hold a general session so that all the members would hear every paper read, and that the session should be continued longer than usual. The most distingished American *savans* are present, and a very instructive and interesting session, thus far, has been held. We shall continue to give extracts, in future numbers, of the most practically useful papers presented.

Magnetic Observations.—Professor Bache read a paper on observations made at the Girard College, in Philadelphia, on the "Variations of the Magnetic Needle." These were illustrated by diagrams which exhibited the variations in summer and winter. Professor Bache said: "The regular daily movement of a magnetic needle is very small. The north end of a needle, 14 inches in length, moves in summer about the one-hundredth of an inch eastward in the morning, and about the same distance westward in the afternoon, making the whole movement about the fiftieth of an inch. In winter the movement is only half as great. To trace the laws of motions so very small is evidently a delicate task, and it is made more difficult from the fact that these laws are complicated, and frequently marked by disturbances." At a previous meeting he had shown how the auroral disturbances were eliminated, and how the examination confirmed R. Wolff's curious discovery of ten or eleven years' period corresponding with the period of the solar spots. They used Professor Pierce's mathematical rule for determining when the observation is to be considered as that of a disturbance, and when that of a regular or normal position. Without this criterion, the observations were insufficient to rest upon for accurate results. The greatest movement is about ten days after the summer solstice, and the least about ten days after the winter solstice—the passage through the average movement is about ten days after the equinoxes. The needle is, unless disturbed, in its mean position about 10h. 26m. in the morning, and at its furthest westerly declination at 1h. 16m. in the afternoon. These times vary but little in the course of the year, and would be the best times to take observations. The secular changes, or changes from year to year, are difficult to eliminate, from certain physical reasons. From June to October the north end of the needle is east of its mean position, and from October to June, west. The amount of this range is thought to increase or diminish with the amount of secular change."

Professor Joseph Henry remarked that this paper was not only a very interesting, but a very marked instance of the triumphs of patient, wisely-directed labor over complicated difficulties.

Mr. James Hyatt suggested that a connection might be traced hereafter between secular changes in the seasons and in magnetism. Might not Renou's period of severe winters, once in 42 or 43 years, be the quadruple of the solar-spot period?

The second annual mowing and reaping match of the Livingston county (N. Y.) Agricultural Society was held at Geneseo on the 12th and 13th ult., and was the greatest trial ever held in the United States. There were 21 machines, drawn either by two or three horses, entered for mowing, and 11 two-horse machines and one single-horse for reaping. Many thousands of farmers were on the ground; the decision on the prizes has not yet been made known to us.

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THUNDER AND LIGHTNING.

MESSRS. EDITORS:—An article on "Atmospheric Electricity," published on page 73, of the present volume of the SCIENTIFIC AMERICAN, fully corroborates my own observations and experiments with electricity and lightning-rods. The theory of the lightning-rod is, that it disarms the surcharged cloud which may hover over the building protected by the rod. Franklin and his cotemporary electricians never claimed for the rod that it should receive thunderbolts. They claimed that the rod should carry lightning from the impending cloud to the earth *silently*. The rod is (theoretically) intended to *draw* the charge from the atmospheric magazine; not to receive the red-hot shot as fired from Jupiter's cannon. You are correct in saying that rods "do not cause a disruptive discharge when one would *not* have been made if the rod had not been erected." There should be no disruptive discharges upon a lightning-rod that fulfills the office of its inventors, or else the experiment of the "thunder-house," as used to illustrate the nature and effects of atmospheric electricity in its silent as well as in its disruptive habitudes, means nothing. That the rod is a protection to an area of surface equal in diameter to four times the length of the rod's projection above the building is the practical truth of its efficacy, but not always, if at all, to thunderbolts; it is only so when the surcharged thunder cloud comes within that distance of the point of the rod, that the electricity is silently conducted from the cloud to the earth. This does occasionally really happen. Mr. Daniel George, of Philadelphia (a practical manufacturer of electrical apparatus), called my attention to the fact, one night, when a terrific thunder storm was raging over the city of Philadelphia. We went to the top of his building through a trap-door, the clouds were heavy, flying very low and surging violently around; it was one of those thundergusts that inspire terror in those who are ignorant of electricity, and sublimity in the mind that contemplates it in an intelligent manner. The rod on this house had its point illuminated on that occasion. He informed me then that he only saw this illustration of the rod's efficacy when this kind of storms prevailed, and for that reason he invited me to the top of the building, knowing that I was also engaged in the construction of electrical apparatus at the time.

I have examined many lightning-struck buildings that had lightning-rods on them, erected as the theory of the rod directs. Now permit me to state, in all candor, the results of these observations. Some buildings were struck on the end of the roof or apex farthest from the end surmounted by the rod. The damage in these cases rather overbalanced the damage sustained in the cases where the rod received the bolt. In cases where the rod was struck, there was always a dispersion of the bolt; some run down the rod into the earth, rooting it up, and some of the bolts (electric fluid) would knock off shingles, shiver the end rafters of the building in others, knock off bricks from the top of the chimney, and sometimes knock to pieces the brick gable ends as though they had been struck by a cannon ball. Where it struck barns filled with grain and hay, the destruction by fire has been as fatal to the barns which receive the bolts on their rods, as the barns that received the bolts without rods. In the latter case I have ever been confronted by the lightning-rod men with the allegation that the rod was not properly erected. In most cases I knew that the rods were erected in accordance with the rule laid down, namely, the rod projecting above the building, contiguous in its length by screw joints, running into the earth six feet, with the lower points for distribution; yet with all this the barn was burned down. A very small portion of disrupted lightning will set fire to a barn in the heat of summer, when a very heavy bolt will do no more to a dwelling-house than to knock off the shingles where it strikes, capsize the top of a brick chimney, knock in the gable apex of the wall and perform pranks through the interior of the house that puzzle all electrical and dynamical philosophy. Barns suffer the most, hereabouts, by thunderbolts. The reason is this. In warm weather, a barn stowed with hay or grain presents two favorable conditions for ignition and conflagration that do not exist in dwelling-houses and other buildings. The warm gases evolved from vegetable matter, like stacked and stored hay and grain, being both conductive and supportive to ignition and combustion, cause the greater fatality to barns. The hay or grain presents to the spark (sometimes intense scintillations of sparks from the exploded bolt) the same conditions presented in the knob of the "discharging rod" when covered with cotton sprinkled with powdered resin, when we show the power of the electrical spark as drawn from the prime conductor of the electrical machine, in contradistinction to drawing the charge from it with a "pointed rod."

In the last case of my observations, only a few weeks ago, in this city, I made a close inspection of the dynamic character of the thunderbolt. In this case it struck a chimney (unsurmounted by a rod). It was seen coming in an oblique direction. Its force upon the bricks, some two dozen of them, was similar to that in the case of any solid projectile coming in the same direction with an equal force. This indicated that a *material* body had struck the bricks, and struck them under the ordinary law of dynamical force.

My observations teach me that metallic-roofed-houses are protected from injurious effects of lightning. In these, for greater security, I would advise a connection with the water conductor below, and the latter put into connection with a hydrant pipe or street gas pipe. Since our farmers are adopting the slate roof for barns, they also diminish the loss of barns by thunderbolt conflagrations. Upon slate roofs it glances off; but upon shingled roofs there is a fuzz that is easy of ignition. Upon straw-covered(thatched) roofs there is, as it were, an invitation to Jupiter for a display of his pyrotechnics. And these conditions hold good, rod or no rod.

My observations on electricity, while sailing in and above the thunder cloud, corroborate the electrical theory of Professor Joseph Henry. When the rain drops come from a cloud, surcharged, as I know they are, with positive electricity, they are neutralized of their *active* electricity in two ways before they reach the earth, though they do *sometimes* reach the earth in their active state and do emit sparks in striking it. Firstly, when the rain falls from the upper to the lower cloud, the surcharged rain-drops give up their active electricity to the lower cloud. When the lower cloud is not capaciously negative to receive it all, an explosion follows, like the spontaneous explosion of the Leyden jar when you attempt to force more upon it than its capacity will bear. Secondly, the condition of the air below the cloud may be such that, as the cool drop of water is descending, it is combining with more water by the contact of its cold surface to constant new accessions of warmer air; thus the drop becoming larger, and in that proportion diminishing its positive or active condition.

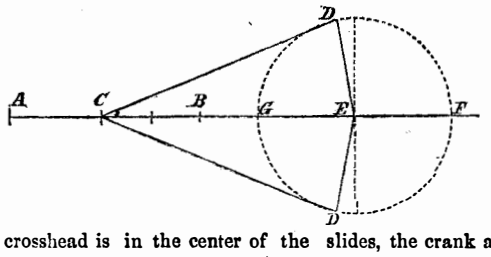
JOHN WISE.

Lancaster, Pa., August 4, 1860.

[It is true, as our correspondent states, that barns, when filled with grain and hay, are frequently struck by lightning, but not from the causes stated. The warm gases evolved from vegetable matter are generally carbonic acid and some nitrogenous mixtures, which will not ignite because they are not sustainers of combustion. Warm gases, also, if not the very worst, are very poor electric conductors, so that they do not invite electricity nor conduce in the least to the destruction of barns by lightning. Mr. Wise has given us in his communication considerable information respecting what are commonly called "thunderbolts," and his views on this subject are quite interesting and novel.—EDS.

A PROPERTY OF THE CRANK MOTION.

MESSRS. EDITORS:—The T-head, C, when in the center of the slide, does not bring the crank at right angles with a line drawn through the center of the cylinder, but brings it nearer to the cylinder. Now, what I wish to know is this: Let A B be the slides, C the cross-head in the center of the slides, D E the crank. When the



crosshead is in the center of the slides, the crank assumes the position, D E; the crosshead has traveled half-way, but the crank has not. How is it that the crank has to travel through the arc, D F D, on one part of its revolution to bring the T-head to the center of the slides, and on the other side it only travels through the arc, D G D, to bring said head to the center of the slides. Please explain it to me, and also tell me what the irregular motion of the crank consists in?

A MECHANIC.

Cincinnati, Aug. 6, 1860.

[It appears to us that our correspondent's diagram explains the matter, and that any words added would merely have the effect to confuse it.—EDS.

A NEW WAY TO LAY THE ATLANTIC CABLE.

MESSRS. EDITORS:—On page 41 of the present volume of the SCIENTIFIC AMRICAN, I noticed a "leader" concerning some new efforts about to be made for laying a new Atlantic telegraph cable; I therefore take the liberty of presenting the following hints for your consideration and that of the practical portion of the public, all of whom are more or less interested in this international undertaking.

I believe I made the first wire rope that was ever made west of the Allegheny mountains. In the year 1830–'31, I constructed wire ropes for the several ferries across the Ohio river at Wheeling, some of which were more than a mile in length. I have, therefore, practical experience, which is often better than theory. Circumstances which are apparently trivial in themselves are usually of vast importance to the successful issue of a new and untried enterprise. I read carefully and with great interest all the details of the first experiment made in laying the Atlantic cable; and with much regret did I learn of its failure, one reason of which, I believe, was the method of stowing the cable in the vessels. It is a fact well-known to most persons, and especially to sailors, that when a rope or cable, coiled in one continuous direction—either *with* the "lay" of the rope or *against* it—is "payed-out," it has a tendency, in one case, to twist tighter, and in the other to untwist itself. The more rigid and unyielding the fabric in its texture, the more the evil will be increased, especially if it be important that the integrity of every inch be scrupulously preserved, as is the case in ocean telegraphic cables.

Now the remedy for the above evil is so simple that I feel astonished that no person has previously suggested it. Instead of laying down the coil in *one* direction, let it be laid in the direction of the figure 8, that is to say, a double coil, crossing in the center. Thus, each alternate coil *neutralizes* the other in "paying-out"—or, to speak more familiarly, whatever twist one coil may put into the cable, the other will take out of it; and if the cable be composed of straight wires, parallel to the length, their position will be preserved undisturbed, and the insulating covering (whatever it may be) will remain intact, other things being properly managed. It would be almost impossible to "foul" such a cable in coiling, as each layer must necessarily retain its relative position; and hence a facility and safety in "paying-out" would be obtained to a much greater degree than in the old way.

E. MATHERS.

Fairmount, Va., August 1, 1860.

COFFEE.—The consumption of coffee is estimated in the following manner:—The whole of North America consumes 337,500,000 lbs., being in the largest proportion. France, Switzerland, Spain, Italy, Portugal and adjoining islands, consume amongst them only 202,500,000 lbs.; Germany, including Austria, 292,500,000 lbs.; Holland and Belgium, 142,500,000 lbs.; Denmark, Sweden, Russia, Finland and Poland, only 75,000,000 lbs. among them, owing, probably, to the fondness of those nations for something stronger. Great Britain and Ireland consume about 60,000,000 lbs.

CURE FOR COLIC IN HORSES.—E. H. Ezell, of Houston county, Ga., advises (in the *Southern Field*) simply to pour cold water on the back of the animal for fifteen or twenty minutes. Pour the water on from the withers to the loins, so as to run profusely over the sides and stomach. He has seen it tried in fifty instances. It will give almost entire relief in one hour.

AMERICAN INSTITUTE FAIR.—The thirty-second annual fair of the American Institute, will be held at the Palace Gardens, in Fourteenth-street, this city, commencing on Tuesday, September, 25th.

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TALK WITH THE BOYS

A Dialogue in Practical Science between a Father and his Sons.

No. 1.—Gas.

"Father, what is gas?"

"Any substance while it is in the state of air or vapor is called gas. Water assumes the gaseous form under the full pressure of the atmosphere at a temperature of 212°. If a vessel of water is heated over a fire, some portions at the bottom first acquire such a temperature that they are expanded into vapor, when they rise in the form of little globes, producing that peculiar commotion in the liquid which is called ebullition, or boiling. If the pressure of the air on the water is lessened, by carrying it up a mountain, it takes the gaseous form, or boils, at a lower temperature; while if the pressure is increased by confining it in a tight steam boiler, it requires a higher temperature than 212° to convert it into vapor. Some substances boil at lower temperatures than water, as alcohol at 173° and sulphuric ether at 96°, while others require a far higher temperature, the boiling point of mercury being 662°. It is supposed, however, that all substances would take the gaseous form if sufficiently heated."

"But we meant gas that is used to light houses with."

"Oh! illuminating gas. This is composed almost wholly of two substances—carbon and hydrogen. Hydrogen, when uncombined with other substances, has never been seen in either the liquid or solid state; it is therefore called a permanent gas. In combination, however, it is solid enough, as you have found if your feet ever slipped up on the ice, for it is one of the component parts of water. Charcoal is almost pure carbon; so is the diamond. Illuminating gas is a mixture of two gases, each of which is composed of hydrogen and carbon. But if I am to explain chemical combinations to you, I must have some little balls to do it with. What is the very lightest substance that you can think of that can be made into a little ball?"

"Pith of elder."

"Yes, or of corn stalk. Neither of these is light enough, but we must take what we can get. You go, Charles, and get a piece of dried corn stalk and make a lot of little balls of the pith, all of the same size, and I will make a number of wood of the same size but six times heavier; and, John, you may go and ask your mother for a needle and thread."

"How large shall I make the balls, father?"

"We will make them of a convenient size to handle, for if we make them as small as we can, they will still be thousands of times larger than the atoms that I want to represent with them. Now, to be just right, the wooden balls should be precisely of the same size as those of pith, and should be just 6 and 4 one-hundredths times more heavy. The pith balls are intended to represent an atom of hydrogen, and we will mark them H."

"What is an atom?"

"It is something that nobody ever saw, but it is supposed that all matter consists of portions so small that no human mind can conceive of their exceeding minuteness, and these portions are called atoms. Atoms of carbon are 6 4-100 times heavier than those of hydrogen, and I will mark my balls C, to represent atoms of carbon. Now, give me the needle and thread and I will soon show you the chemical combination of illuminating gas. I will first fasten two atoms of hydrogen to one of carbon, and this forms an atom of *light* carbureted hydrogen. When we wish to speak of it, instead of writing out the names of the substances in full, we will simply use the initials, marking the H with the figure 2 to show that there are two atoms of hydrogen, thus C H2. Every chemist, when he sees those letters written in that way, understands that they mean one atom of carbon combined with two atoms of hydrogen, forming one atom of light carbureted hydrogen. This is one of the two gases which, when mixed together, constitute illuminating gas. The weight of an atom of hydrogen is called 1, its atoms being lighter than those of any other substance; and as the atom of carbon is 6 and 4 one-hundredth times heavier than the atom of hydrogen, its atomic weight is said to be 6.04. As the atom of light carbureted hydrogen consists of two atoms of hydrogen and one of carbon, what is its weight? Can you tell, Charles?"

"What do you mean, sir, its weight as compared with the weight of one atom of hydrogen?"

"Precisely."

"The atom of carbon is 6.04 and the two hydrogen atoms are one each, making 8.04."

"Consequently, if we had 804 lbs. of light carbureted hydrogen, how many pounds would it contain of each of its elements? You can answer that, John, can you not?"

"There would be 604 lbs. of carbon and 200 lbs. of hydrogen."

"Certainly. Now, give me four of the pith balls and four of the wooden balls, and I will show you how an atom of heavy carbureted hydrogen is formed. I do it by fastening the whole together, and the atom thus formed is expressed by the initials or symbols, C4 H4. Can you give us the weight of that, Charles?"

"If one atom of carbon is 6.04, four of them will be 24.16, add four of the hydrogen, which are one each, will make 28.16."

"That is it. I think you must have now a very clear and distinct idea of what is meant by the atomic weight of any substance.

"It means that one of its atoms is so many times heavier than one atom of hydrogen."

"Exactly. Heavy carbureted hydrogen is also called olefiant gas. Can you tell, Charles, from the derivation, what that means?"

"Is it, from *oleum*, oil, and *facio*, to make; oil making?"

"Yes, primarily; though more immediately from *olfacio*, probably. When mixed with chlorine and condensed it forms an oily liquid, from which property it has been named olefiant gas."

"You say illuminating gas consists of a mixture of the two gases—light carbureted hydrogen and olefiant gas?"

"Yes, principally; though there are generally small quantities of several other substances, but they may be regarded as impurities. Though the olefiant gas constitutes but about 15 per cent of illuminating gas, it produces nearly all the light, and the quality of gas depends mainly upon the peoportion of olefiant gas which it contains. In illuminating gas these two gases are not combined with each other chemically, but are simply mechanically mixed. Therefore, to have a complete illustration of the chemical combination of this valuable substance, we will prepare a number of balls to represent atoms of light carbureted hydrogen, and a number for the olefiant gas, and mix them together in a bowl, in the proportion of about one of the latter to five of the former. The fact that the primary atoms are fastened together with the thread to form each of the gases, and that the secondary atoms are simply mixed together, will give us perhaps as good an idea as we can get of the difference between chemical combination and mechanical mixture."

"What becomes of the gas when it is burned, and how is the light produced?"

"You will find that part of the subject very interesting, but I think we will postpone it till next Saturday."

An Injurious Fertilizer.—Very severe prohibitions have been issued in France, England and Germany against the use of *poudrette* imperfectly prepared, it having been proven by careful experiments that the fœcal matter of sinks cannot be converted with safety into garden manure under five years' careful preparation. Pestilential and other diseases are propagated by vegetables grown in soil thus manured. Yet, it is stated that these death-dispensing deposits are absolutely used in the market gardens around our large American cities in their natural state, and many of the fruits and vegetables so grown can be told by the nostrils or the taste before they are cooked, and in the process of cooking. It is the opinion of skillful medical observers, that nearly all the novel diseases which now afflict many American cities, owe their origin to the organic diseased matter taken up by vegetables and fruits grown in soil dressed by the fœcal matter of the sinks, and transferred to the stomach. Galloping consumption in persons whose families have never been subject to this terrible disease, have been traced to the use of vegetables grown by *poudrette*. This is only one instance out of a thousand.—*Exchange.*

[Most of the manures used in China, Holland, England and Scotland are transferred directly from sinks to the soil; but the former are regularly cleaned out once or twice a year.—Eds.

A COLUMN OF VARIETIES.

During the year 1859, no less than 4,000,000 yards of cotton goods were exported from England daily.

Man holds his life by a very frail tenure. A distinguished physician in France recently lost his life from the puncture of a suture needle which had been thrust into a tumor.

The artesian well in progress at Macon, Miss., is now throwing a column of water some 15 feet above the surface of the earth, but it is so strongly impregnated with soda as to be entirely unfit for use.

To hit a target with a rifle at the distance of 900 yards is first-rate shooting, indeed. At that distance, a military target appears about the size of a pin's head on a postage-stamp.

An alloy, composed of 3 lbs. of lead, 16 lbs. of tin and 3 lbs. of zinc, is capable of being rolled out into plates for making white-ware of a superior quality, as a substitute for Britannia metal.

It is stated, in a late foreign paper, that bathing has been found to be a certain cure for *pleura-pneumonia*; that a gentleman in Ireland, who tried the experiment on eight cattle who were infected, saved seven of them by driving them into a bath.

The people in several districts of New Orleans are suffering greatly from the effects of the drought. The heat of the sun has so warped the cisterns that they will not hold water. As a consequence, whisky barrels, &c., are resorted to.

A great number of very large spots in the sun's atmosphere have recently been witnessed at the observatory in Paris. They occupy, for the most part, two zones parallel to the solar equator, along which they are disposed in from 10 to 12 groups, containing about 60 spots.

The city of London, copying from New York, has lately been laid out into telegraphic districts, for the conveyance of telegraphic messages between merchants in their warehouses and their families living in distant parts of the city. The messages are charged at the rate of fourpence (eight cents) for 10 words, and sixpence for 20 words.

Several applications of wax are made by the Greeks for medicinal purposes. Thus: to hasten the suppuration of tumors, to protect certain organs from the cold, to reduce mammary swellings, linen steeped in melted wax is applied, which, when too hard, is slightly warmed over the fire and then applied to the part. Wax being a bad conductor of heat, and allowing no passage to the perspiration, the parts covered remain protected from the cold and air.

Moths are very destructive to woolen cloths and furs during the seasons when these articles of apparel are not worn. To prevent their ravages, woolen cloths and furs should be usually kept in close glazed linen bags, from which they should be taken once a week and carefully switched. Benzoin and some of the other aromatic gums prevent the attack of moths in furs; but these creatures dislike to be disturbed, and hence the virtue in frequently switching articles in which they delight to revel in quietness.

Marine glue is made by dissolving india-rubber in napththa, and adding to it powdered shellac until it is of the proper thickness. It is always applied hot, and is very adhesive under water. Fine shreds of india-rubber, dissolved in warm copal varnish, also make a waterproof cement for wood and leather. Take glue, 12 ounces, and water sufficient to dissolve it; then add 3 ounces of resin, and melt them together, after which add 4 parts of turpentine. This should be done in a water bath or in a carpenter's glue-pot. It makes a very good waterproof glue.

A vessel lately put into Newport, R. I., in a leaky condition; having been saved from sinking while on her voyage to New York from England by the captain grinding up a lot of barley which he had on board, placing this in a large canvas bag, which he attached to a pole and ran under the vessel's bottom, as near as he could ascertain, to the place where the leak was. This was, by the force of the water passing through the opening, drawn into it, and stopped the leak for 11 days, giving the crew rest, and allowing the bark to proceed on her voyage. This is a case worthy of notice by nautical men.

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IMPROVED SELF-ACTING WAGON BRAKE.

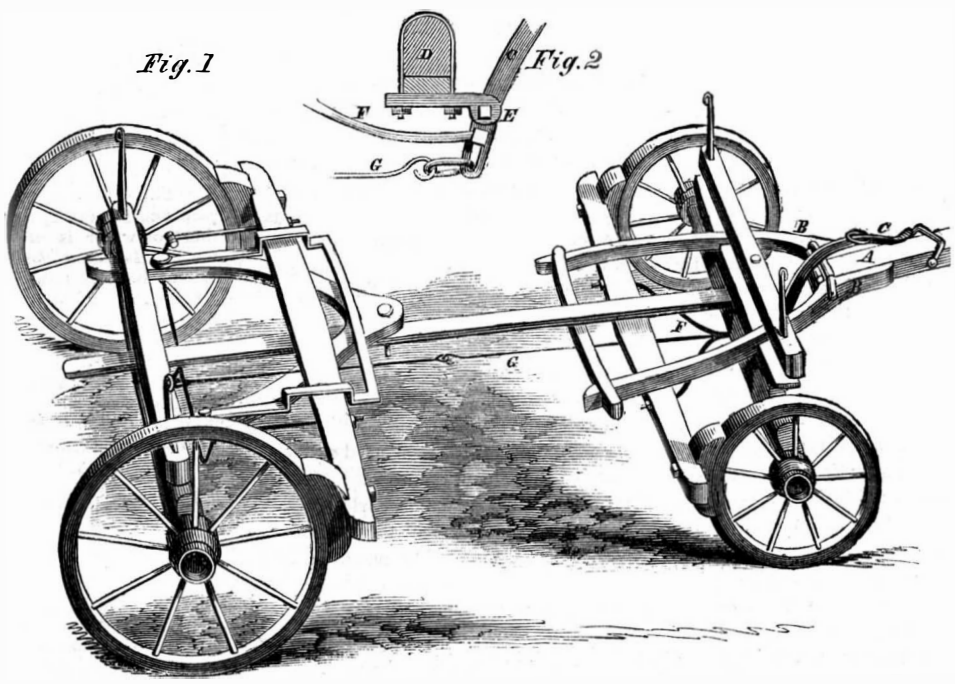
In traveling through the country nothing, in vehicles, is more noticeable than the almost universal introduction of brakes. They are to be seen not only upon all stages and heavy wagons, but on many private carriages. This extensive demand for this article is a perpetual stimulus to inventors to make improvements in its construction, and we are procuring a constant series of patents for inventions in this department.

The brake illustrated in the accompanying engraving is of the self-acting class, and at the same time it is capable of being operated by hand, at the will of the driver. The hole in the pole, A, by which it is attached to the hounds, B B, is made oblong, so that the pole may slide back and forth in the hounds. The lever, C, is secured to the forward axle, D, in the manner shown in Fig. 2, having its fulcrum at E. When the pole is pushed back, as it will be in going down hill, its end presses the lever, C, upward and thus draws forward the rods, F and G, which actuate the brakes. A friction roller is interposed between the end of the tongue and the lever, C.

For operating the brake by hand, a ring is secured to the lever, C, and a strap, being fastened to this ring, is brought up within convenient reach of the driver. When it is desired to back the wagon, the brake is rendered inoperative by pressing the lever, C, so that its end may catch under the loop prepared for that purpose on the upper side of the pole.

Many self-operating brakes have been invented, but this is the only one we have seen which is automatic and, at the same time, capable of being operated manually.

The patent for this invention was procured, through the Scientific American Patent Agency, July 24, 1860, and persons desiring further information in relation to it will please address the inventor, H. W. Norville, at Livingston, Ala.



NORVILLE'S SELF-ACTING WAGON BRAKE.

PATENT RIGHT FOR TANNING WANTED.

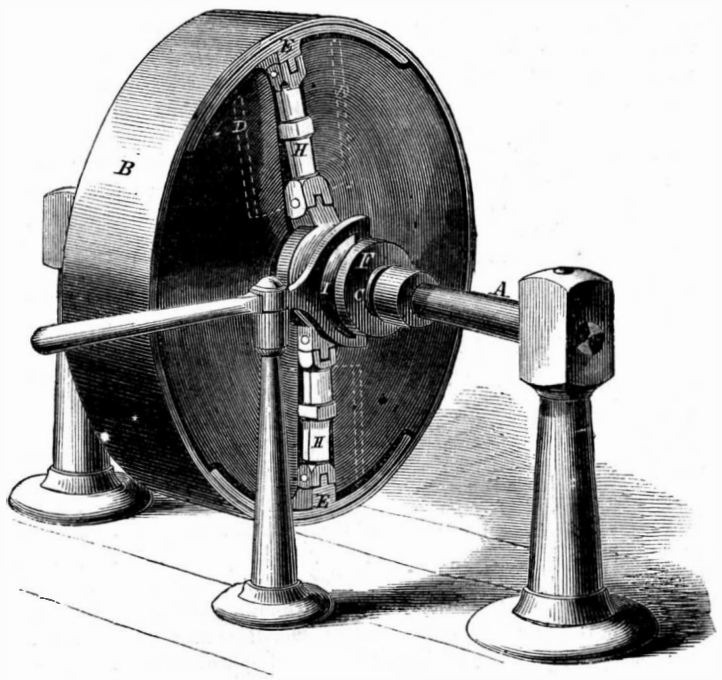
MESSRS. EDITORS:—Looking over a file of old papers, I noticed a statement that one-half a patent right for tanning leather was sold in New York for $300,000. I am just starting the tanning business here, and any information I can get in relation to the best mode of sinking a tan-yard and saving labor would be thankfully received and liberally paid for. Perhaps some of the patentees are in New York; if so, I would like to have them write to me and let me know the nature of their processes, and how much the right would cost for a tannery using $3,000 capital.

WM. W. SITTLER.

Batesville, Ark., July 24, 1860.

WRIGHT'S FRICTION CLUTCH.

The two sections of the paddle-wheel shaft of the *Great Eastern* are coupled together by a friction clutch, and this device is coming into very extensive use in many mechanical operations. It is especially advantageous in places where it is desirable to permit a slip in case of excessive strain upon the parts, and it relieves the machinery, in starting, from the sudden shock caused by throwing cog wheels into gear while they are in motion.



WRIGHT'S IMPROVED FRICTION CLUTCH.

The annexed engraving represents a very compact and simple clutch which was invented and patented by Wendell Wright, an ingenious and well-known mechanic of this city, but which has been considerably improved by Wm. J. Innis, of Providence, R. I. Several of these clutches are in operation in the vicinity of Providence, some of them in driving heavy water-mangles requiring 20 horse-power, and they are said to give entire satisfaction.

A is the shaft upon which is placed the loose pulley, B, which is made in the usual manner and turned on its inner surface. C is a plate or disk made fast to the shaft. D D are ribs cast on the face of the disk into which two segments, E E, are dovetailed so as to slide easily; the segments, E E, are made of the same circle as the inner surface of the pulley. F is a thimble fitted loosely to the hub of the disk, C. H H are diagonal rods or braces which connect the thimble to the segments, E E. The diagonal rods or braces are made adjustable by means of a right-and-left screw, so as to get any amount of friction to carry the machine. When it is desired to start the machine, the thimble is moved towards the disk by means of a lever which fits into the groove, I. This causes the segment to press into the pulley, so as to cause sufficient friction to carry the machine. When it is desired to stop the machine the thimble is moved from the disk; the friction is thereby withdrawn and the pulley instantly becomes a loose pulley. This pulley is very easy to operate and is entirely free from noise.

These clutches are manufactured by the Providence Friction Clutch Company, of whom further information in relation to them may be had by addressing them at Providence, R. I.

SEWING MACHINES—GREAT PATENT CASE.—"On the 31st ult. (as reported by telegraph), Judge Dunlap, of the United States Circuit Court, Washington, decided, on appeal from the Patent Office, that Akins and Felthousen were the first inventors of the wheel feed in sewing machines, ordering a re-issue of their patent to James G. Wilson, their assignee. This re-issue was opposed by I. M. Singer & Co., who claimed to have made the invention in 1850, while the judge decided that Akins and Felthousen made it in the early part of 1849." Mr. Wilson, as assignee, applied, on the 8th of December, 1858, for a re-issue of the patent of Akins and Felthousen, which had been originally granted on the 5th of August, 1851. This was declared by the Commissioner of Patents to be an interference with the patent of I. M. Singer and, in the trial which resulted, the re-issue was refused to J. G. Wilson, by the Commissioner. This decision of the Commissioner having been appealed from to Judge Dunlap, it has been reversed. This whole case has become very complicated, and is mixed up with the interests of other patentees whose names are not given above. The specification and drawings on which this appeal was taken were prepared at this office.

ENGLISH INDUSTRIAL REFORMS.—The workingmen of England are still agitating for what is called the "nine hours" work law. Lord Robert Montagu, M. P., presided at a recent meeting of the body, in London, when he said:—"I have been told—and I believe truly—that the cause of the failure of so many mechanics' institutions is to be found in the excessive labor of the working-class, who return to their homes so exhausted that they can take no pleasure in intellectual pursuits. I have also been told—and I believe truly—that the same cause helps to fill the public houses. I believe with Mr. J. S. Mill, that the invention of machinery was intended to diminish human labor, but that in its result machinery had supplanted and not helped humanity. I believe that it is essential to the existence of every nation that its population should not be ignorant and morally corrupt. Italy, Spain, Venice and Genoa, have fallen from this cause; and England could never make head against its foreign enemies, if ignorance and moral degradation were to spread amongst the people. They therefore require more leisure time."

AMERICAN cotton manufacturers have done a most profitable business during the past year; and their prospects for the future are also very encouraging. The anticipation of good cotton crops from all parts of the world is affecting the manufacturers of England in a surprising manner. In Lancashire, about 40,000 factory operatives are wanted, and in the small manufacturing district of Bury, no less than 39 new cotton factories are now being erected.

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VOL. III., No. 7.....[NEW SERIES.]....*Sixteenth Year.*

NEW YORK, SATURDAY, AUGUST 11, 1860.

AMERICAN LANDSCAPE GARDENING.

THE usual accompaniments of refinement and civilization are displays of the fine arts, such as painting, statuary, elegant cabinet works and architectural decorations. These are all very well in their place, but there is another art which deserves a much higher position than is generally assigned to it by those who form their ideas of refinement by the display made in our cities; we mean the art of landscape gardening. The highest style of art consists in cultivating nature in the best manner. No work of art is really beautiful which is not in accordance with natural laws, and no people can become truly refined who do not possess a taste for the beauties of nature. The most gifted and cultivated minds have ever found delight in rural scenery. In the days of Augustus, when the Romans had attained to a state of civilization nearly equal to that enjoyed by us at the present day, landscape gardening held a high position. In the strains of Virgil we can almost fancy that we hear the hum of his bees, the bleating of his flocks and the murmurs of his fountains, as the poet sat at noon-tide under a shady bower, enjoying the sight of cultivated fields. The great Newton took exquisite delight in his flower garden, which was said to be the neatest in all England. The graceful lawns and beautiful gardens attached to the mansions of the noble and wealthy men of Europe are better evidences of true refinement than the monuments of marble, the galleries of paintings and the gorgeous temples of their cities. These facts are now being appreciated by our people. In the early settlement of our country, the struggle was severe to subdue nature in the rudest form, so as to obtain the fruits of the field for the necessities of life. The beauties of art, as the handmaids of nature in rural cultivation, were then held in abeyance to the rude but pressing demands of necessity. But as national wealth has accumulated, so has there been a commendable search for enjoyment in the rational and elevated refinements of cultivated nature. The late Mr. Downing, whose name and fame are world-wide, said, wrote, and did much to spread abroad a taste for landscape gardening, and he was eminently successful in his labors. Within the past twenty-five years, especially, there has been a vast increase of general and individual wealth, and it affords us much gratification to witness a proportionate diffusion of taste for rural beauties. A recent short tour in some of the districts bordering on the Hudson river has impressed us most favorably respecting the growing taste for the sublime and the beautiful in nature, combined with art. Go where we may, we behold grassy lawns, like beds of emeralds, surrounding stately mansions. Silver streams are trained to send forth their sparkling showers from numerous fountains; and the banks of our rivers are becoming as attractive for highly-adorned scenery as those of the Thames and the Rhine. We commend this growing national taste for the beautiful in nature, and exhort our people to indulge in it with persevering enthusiasm. The climate and soil of the United States are most favorable for superior landscape gardening. We have lofty mountains, broad lakes, deep and noble rivers, fertile vales and extensive plains and an almost tropical vegetation; and these certainly are natural advantages of the very highest order. American travelers in England used to speak with enthusiasm of the trim hedge-rows, the neat fields and the high style of gardening displayed on every hand, foreign travelers in America now admit that the national taste for rural beauty is not inferior to that displayed in Europe, and that we are progressing to the attainment of the very highest position for landscape gardening.

EXPLOSIONS OF BOILERS AND THE CAUSE.

A review of the "city items" column in the daily papers, for the last year, will disclose a frightful array of casualties and accidents arising from this source. If these occurrences involved in their destruction only those who were in the immediate charge of the boilers, it would be painful; but when we reflect upon the number of innocent people who suffer in the general ruin and havoc, it becomes more lamentable still. And yet, in the main, there is little or no excuse for them; we take strong and bold ground, and do not speak without having fully considered our position. When we see men, as we *have* seen them, go into their factory in the morning, perhaps a little late, throw in their kindling-wood and start up their fire with all possible dispatch; never so much as trying a gage to see if the water which they left in the boiler the night before has not, by some unforeseen accident, leaked out—when we know of ignorant watchmen, who have been placed in charge of the premises, lighting the fire before the arrival of the engineer (as they are often required to do), then need we wonder that accidents are of so frequent occurrence? Shall we not think, with justice, that a merciful Providence spares men's lives when the carelessness of their fellow-men jeopardizes it, time and again? The practices abovementioned form no slight ground for comment. We can understand more fully now this stereotyped phrase in the daily journals:—"It was fortunate that the accident occurred *so early*, as all the hands employed had not yet arrived." In addition to all this, we have actually seen men come up to a boiler, and finding the water (or not finding it) below the level of the lowest cock, turn on the "feed" with the utmost placidity, as if there were no such things as overheated flues and red-hot crown sheets; and only escaping death from the fact of the lowest gage being at a great hight from the crown sheet, or from the good luck of the water being sufficient to avoid danger. We repeat again, that when such practices obtain, is there any room for wonder? We should speak at random, and render our few words upon this subject valueless, if we asserted that boilers never exploded but from want of water, for it is well-known that they *do*; but, whatever the cause and whatever the deficiency, it can, in most cases, be obviated by a careful, cool-headed and intelligent superintendent.

This experience and these statements are not derived from books, full of theories, or from scientific analysis of superheated steam, ozone, or the endless category of hard names which are called into requisition on the occasion of every explosion; nor would we, while disavowing this view of the subject, cast any slight upon those philosophers and experts who are carefully and conscientiously considering the subject in this light; but our observation and deductions are drawn from personal experience—from perspiring over boilers, on water and land. We arrive at the conclusion that by far the greater part of the evil complained of might be averted by careful management, for it is an evil and a sorrow that the pen is powerless to depict, all sympathy is idle, and all sentiment is turned into rhodomontade, when one looks upon the victims of the engineer's carelessness.

If, upon examination of the boiler or boilers of an establishment, we find the water-bottom undistinguishable from the mass of ashes and cinder accumulated upon it; the spaces between the socket bolts filled up with sticks and rubbish, and the crown sheet suspiciously low in the center, need we but infer that at some future day, not far distant, we shall see another item unless matters are speedily changed? There is an old proverb, particularly applicable to engineering, which is:—"An ounce of prevention is better than a pound of cure;" and there never was a truer maxim, or one which an engineer might bear in mind to a better purpose. The American character is strongly prone to recklessness and haste—we like, as a people, to "run our chance," and take good luck as granted; but we assert it to be much better to lose a little of our reputation for energy and enterprise, and save the lives of our fellow-men, at least, while weighing them in the balance against steam-power. An engineer, of many years standing and experience in wrecking and other branches of the trade (having served on many committees to examine boilers which had exploded), has told us that there were but few disasters which he could not trace to a want of water.

There are many theories of boiler explosions, and nearly every engineer has his favorite one; we shall not dispute any of them, for we could not do violence to any one's opinion, but we append a quotation from "Useful Information for Engineers"—a work written by Wm. Fairbairn, F.R.S., an English engineer of great eminence. After considering the various classes of disasters to boilers—such as collapse, want of proper strength of construction and deficiency of water, he says (of the latter):—

"This division of the subject requires the utmost care and attention, as the circumstance of boilers being short of water is of by no means unfrequent occurrence. *Imminent danger arises from this cause;* and it cannot be too forcibly impressed upon the minds of engineers that there is no part of the apparatus constituting the mountings of a boiler which require greater care and attention—probably the safety valves not even excepted—than those which supply the boiler with water; a well-constructed pump and self-acting feeders, when they can be applied, are indispensable in working at a low pressure; when they cannot be affixed, the glass tubular gage and cocks must have more than ordinary attention."

The above line of argument Mr. Fairbairn pursues through a long chapter; and its force and power are greatly increased by the knowledge that the statements are derived from personal experience; and, what is still more conclusive, is the fact that they are quite unanswerable.

PNEUMATIC TELEGRAPHS AND PNEUMATIC POWERS.

We stated on page 71 of the present volume of the SCIENTIFIC AMERICAN, that a private pneumatic telegraph had been successfully employed for several years in London, and that measures had lately been taken to employ it for more general purposes. The idea of conveying parcels and letters through an air-tight tube is quite old, but practical difficulties have hitherto prevented its perfect application. The advantages of such a system are self-evident, and respecting these benefits the London *Mechanics' Magazine* says:—"It is impossible to foresee all the changes which this pneumatic system is manifestly destined to introduce. It is evident that unless the post-office authorities take the system up, as they undoubtedly should, the whole metropolitan postal arrangement will fall through when once the rivalry of the pneumatic plan is brought into play. It is the beginning of a grand commercial undertaking, for we doubt not the pneumatic despatch system will ere long be even more wide spread than the telegraph system has become, although the circuits will, of course, be much shorter." Such a system applied in New York and all our large cities would supersede local express and post-office carriers. It is a subject worthy of general investigation.

In connection with this topic, a correspondent—Mr. John Turley, of La Grange, Ind.—directs our attention to the convenience and benefits that would result in many cases from applying compressed air as a motive agent for driving machines in factories. He has had considerable experience with mechanism, and asks: "Cannot we get something better than shafting, gearing and belts for driving machinery? I have thought we might use the first power (steam engine or water wheel) to force air into a long cylinder, so that the friction through it would not be much; then let the compressed air from this cylinder operate the whole of the machines in a shop. Whenever we want to start a machine, conduct the air to it by a branch-pipe; and if we lose some of the power by leaks, we can afford to do so by throwing away the belting and counter-shafting. It does seem to me that if we had some good wheel operated by air, we could even save power, as we could do without heavy belts, the friction of shafting and gearing."

These are some of our correspondent's ideas upon this subject, and they are worthy of much consideration by inventors, manufacturers, and mechanics. Compressed air has been experimented with several times, for the very purposes suggested by our correspondent, and if it could be employed for operating machines as economi-

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cally as belting and gearing, its advantages on account of cleanliness and simplicity would be very great. It has been found that cast-iron tubes are not suitable to convey compressed air, because the air leaks through very minute pores, but we think that this difficulty may be overcome by the use of copper pipes or even good iron tubes coated with asphaltum varnish For many situations a pneumatic power for driving machines would be very valuable and desirable. A steam engine might be employed at a considerable distance from the factory, and the compressed air forced through a tube to drive the machinery. Such a system presents a means of safety from fires, and it also provides for thorough ventilation with the very air which would be employed to execute the labor.

EXCURSION OF THE "GREAT EASTERN" TO CAPE MAY.

To give the Americans an opportunity of witnessing her sailing qualities, the directors of the *Great Eastern* steamship determined to send her on a short excursion down the coast to Cape May. She left New York on Monday afternoon, July 30th, at 15 minutes to 5 o'clock, and arrived at Cape May at 7 o'clock, Tuesday morning. Spending the day at Cape May, she returned Tuesday night, arriving at the foot of Christopher-street, New York, at 10 o'clock, Wednesday morning. The charge was $10 for the passage; the staterooms and meals being extra. She had about 2,000 passengers.

The trip, so far as the sailing qualities of the ship is concerned, was successful. The navigation of the vessel by the officers, the discipline of the crew and the working of the huge oscillators that drive the paddle wheels, as well as of the four smaller engines that propel the screw, were all admirable. The weather was fine, the sea smooth and the speed good; but the arrangements for the care and comfort of the passengers were unsatisfactory. It seems that this duty was entrusted to Mr. Cox, the steward of the ship, who showed that he was unaccustomed to catering for excursion parties. It seemed to us that this failure was the result of short-sightedness and ignorance, rather than from a want of a disposition and effort on the part of the managers. Two of the English directors were on board—Messrs. Yates and Bold—and exerted themselves to make people comfortable, if they did not succeed; and it is our opinion that the fault and complaint of discomfort were owing much to the passengers themselves. They got disgusted at the outset because it was impossible for the cooks and waiters to prepare food and serve everybody at the same time. As soon as the ship had passed Sandy Hook, almost every one on board rushed for the dining cabins to order dinner. Hungry men are not the most patient, and, because they could not all be served immediately, they commenced complaining; and many of them began to help themselves. Thus, disorder and discomfort commenced, and it was impossible afterwards to restore satisfaction.

Again: on the Saturday preceding the Monday of sailing, only about 1,000 tickets had been sold, and stores had, consequently, been provided for only that number. On Monday morning the sun came out bright, and as many more tickets were sold. The fact seems to have been overlooked, in the hurry and excitement, that the stores originally provided for 1,000 people were not ample for twice that number. Most of the papers have severely condemned the whole management; but, while we observed many things which ought to have been done for the comfort of the passengers which were not done, we do not feel like using strong expletives against the managers.

Much has been said about the rolling of the ship. We were informed, on board, that she had 700 tuns of water as ballast, which probably accounts for this, although we did not notice as much motion as is experienced on ordinary steamers. Many funny scenes occurred on board; and, notwithstanding the impossibilty of getting meals served in the style of our Fifth-avenue Hotel, and the absence of such conveniences for washing as are found in our modern city houses, we think, to those who took a philosophic view of the matter and were of the turn of mind to make the best of every emergency, the excursion was more interesting than it would have been, had there been more to eat and drink and less grumbling. The absence of a generous supply of ice-water for drinking purposes, and of Croton for washing, and towels for drying, was an unpardonable over-sight; but, in other respects, we think few had but little cause to complain of their treatment on board. We were among the number who paid for their tickets and staterooms, and who neither wished nor received any favors from the officers or directors; and we were among the number who, if they did not get all they wanted to eat and drink the moment they called for it, got it afterwards. We returned with a good appetite, perfectly satisfied with the trip and treatment, and more than ever convinced that the *Great Eastern* is entitled to be called the eighth wonder of the world.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

COTTON-PICKER.

This invention relates to an improvement in these contrivances which have been devised for superseding the fingers in picking the cotton direct from the bolls on the standing stalks. These devices are composed of an endless chain of spurs fitted within a suitable box or case and rotated by the operator, the spurs detaching the cotton from the bolls and carrying the same into the box where the cotton is detached by a stripper and discharged into a sack or receptacle attached to the case. In these implements the difficulty has been to detach the cotton from the spurs, the former adhering to the latter and often choking-up or clogging the implement. Besides the stripping brush, used to detach the cotton from the spurs or teeth, rolls up the cotton in knots and renders it extremely bad for subsequent manufacture. This invention consists in the use of a rotary picker and endless belts so arranged as to obviate the above difficulty. The credit of this contrivance is due to Lewis Jennings, of Brooklyn, N. Y.

CASTING STAMPS AND DIES FOR QUARTZ-CRUSHERS.

This improvement consists in casting the stamps and dies of quartz-crushing machines in a chilled flask, and around and within a hollow chilled center peice, in such a manner that the stamp or die is chilled entirely through. By thus having stamps and dies chilled, they are useful until worn out, whereas when they are chilled only on the surface, a few months wear soon renders them useless. This improvement, we think, is destined to serve a very useful purpose, and to save the miner an immense amount of outlay for machinery to carry out his operations of obtaining the shining stuff from the flinty rock. This device has been patented to P. W. Gates, of Chicago, Ill.

WINDOW BLIND MACHINE.

This invention relates to certain machanism employed for "laying off" and boring the stiles for the purpose of framing them to their rails, and also for boring the stiles to receive the tenons of the slats. The invention further relates to certain means employed for pricking the blind rods, and a novel mechanism for driving the staples in the rods. The object of this invention is to obtain a machine which will greatly expedite the manufacture of window blinds, and perform the work not only very expeditiously, but in a perfect manner. The inventors of this improvement are W. F. Johnson and J. Doyle, of Wetumpka, Ala.

WOODEN BOWL MACHINE.

The object of this invention is to cut out wooden bowls with flanches or rims at their edges, the work to be done at the same time that the bowls are cut out, so as to complete the whole at one operation. The invention consists in having the segment carriage to which the cutter is attached connected to an adjustable or sliding block, and having a supplemental cutter attached to the segment carriage, by which an adjustment of the carriage after each bowl is cut will cause a flanch or rim to be cut thereon. This improvement was designed by Rufus Simonds, of Ludlow, Vt.

FINGER-NAIL BRUSH.

This invention consists in combining with a shallow flaring-mouth cup of a suitable diameter, a circular brush, which latter consists of one two or more rows of bristles, arranged in such a manner that the combination will form a neat and efficient article for cleaning the finger nails. William Thomson, of Buffalo, N. Y., is the inventor.

SEWING MACHINE.

This invention consists in extending the lever which operates the needle, from the rear to the front end of the machine, and providing said lever with a peculiar curved slot for the eccentric pin of the actuating cam to work in. By this arrangement a great length of leverage to operate the needle bar is secured, and the machine is rendered capable of sewing very heavy cloth, leather, &c., yet can be adjusted for sewing light work. Another improvement consists in having the driving cam located directly under the needles, and so constructed and combined with the feed-motion and shuttle, that the greatest simplicity with the most effective action are obtained.

The Patent Office in deciding this case remarked:—"We are free to say that very great ingenuity has been displayed in the adaptation of the several parts embraced in the claims, for conjoint and harmonious operation, and the gradual increase of power which is applied to the needle, and that makes the machine as capable of sewing thick as well as thin cloth."

We endorse the opinion of the Patent Office, for the improvement is a very useful one. The inventor is W. A. Sutton, of this city, and his claim (No. 29,202) was published on page 76 of the present volume.

GRAIN SEPARATOR.

This invention consists in providing the shoe of a separating or threshing machine with an endless lagged elevating apron, so that light straw, heads of grain, &c., falling from the first endless conveyor table of a threshing machine, may be re-elevated and subjected to a second agitation and to the direct action of the fan blast. This is a very useful and valuable improvement, and the patent, as now re-issued, secures to the inventor, Hiram Aldrich, of Michigan City, Ind., the exclusive use of the lagged apron applied directly to a separator shoe; it also gives him protection in the use of a seive between the apron, and likewise to an extension blasting board.

HOT WEATHER AND BURNING WINDS.

In every quarter of the south-west, the heat of the present summer appears to have been unprecedented. In Mongomery, Ala., the thermometer stood for several days at 103° in the shade. In Mississippi, Louisiana, and Missouri, it has ranged from 95° to 105° in the shade, and the people call it "the fiery term."

Several currents of intensely hot air have been experienced which appear to be similar to those which are common in Egypt, Persia, and some portions of India. A hot wind extending about 100 yards in width, lately passed through middle Georgia, and scorched up the cotton crops on a number of plantations. A hot wind also passed through a section of Kansas; it burned up the vegetation in its track and several persons fell victims to its poisonous blast. It lasted for a very short period, during which the thermometer stood at 120°—far above blood heat.

WHERE IS JUDGE MASON?—Many persons daily write to us, inquiring whether Judge Mason can be found at our office in New York or at our branch establishment in Washington. In answer to all such letters we will state that Judge Mason is permanently located in our principal office in this city, where inventors can consult him at any time from 9 o'clock A.M. to 4 P.M. every day. We are enabled to conduct interferences, obtain extensions, render advice on matters of infringement, prepare specifications and drawings for inventors, argue rejected cases before the Commissioner of Patents, furnish copies of papers from the records of the Patent Office—in short, with our present *corps* of consulting-engineers, specification-writers, draughtsmen, &c., in connection with the assistance rendered by Judge Mason, we are prepared to do almost everything in the patent line.

OHIO MECHANICS' INSTITUTE EXHIBITION.—We would invite the attention of our mechanics and inventors to the advertisement of the above institution (page 110), which will hold its eighteenth annual exhibition at Cincinnati. The committee of management intend to make this exhibition the best that has ever been held in Cincinnati.

THE special committee of physicians appointed by the agricultural bureau of the Patent Office to investigate the cattle disease have made a report in which they state the disease is very much like cholera, and, at present, hard to check.

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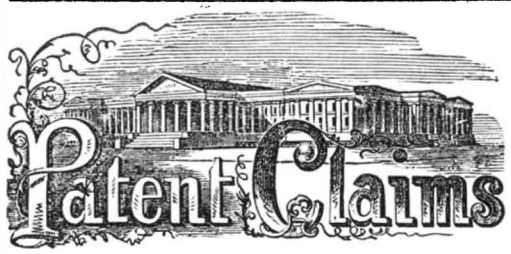

ISSUED FROM THE UNITED STATES PATENT OFFICE
FOR THE WEEK ENDING JULY 31, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

29,347.—James Adair, of Pittsburgh, Pa., for an Improvement in Lamps:

I claim, first, The arrangement and combination of the adjustable tube, E, wick, F, containing the small central tube, g, tube, D, provided with the disk, a, and valve, b, at its bottom, and perforated below the disk, to communicate with the fountain, C, the thimble, G, and burner or tube, H, substantially as and for the purpose set forth.

Second, The hood, L, fitted to the perforated cylinder, I, and rendered adjustable by means of the cylinder, K, in connection with the deflecting lips, M, and the peculiar shaped orifice of the burner or tube, H, for the purpose specified.

[The object of this invention is to obtain a lamp by which volatile hydro-carbons may be burned for illuminating purposes without a chimney. The invention is more especially designed for burning coal oils of the heavier grades, which have not hitherto been successfully burned without a chimney, and, in fact, which cannot well be burned with a chimney when capillary attraction is chiefly depended upon for the supplying of the oil to the flame.]

29,348.—H. A. Alden, of Matteawan, N. Y., assignor to the New York Rubber Company, for an Improvement in Belt Lacing:

I claim, as a new and useful article of manufacture, strips of woven material coated with an india-rubber, gutta-percha, or other suitable cement, that while scarcely or not at all sticky to handle, is firmly adhesive on being subjected to pressure, substantially as specified and applied as a belt or band lacing, as described.

29,349.—Josiah Ashenfelder, of Philadelphia, Pa., for an Improved Journal Box for Railroad Cars:

I claim, first, Making the bottom of a journal-box, whether fixed, movable, or supplementary, to incline downward from the sides and under the axle, for the purpose of reducing the quantity of lubricating material to be employed and more effectually presenting it to the axle.

Second, The box, A, in combination with the adjustable back, B, bearing, D, loose bottom, E, cap, F, and collar, G, substantially as described and for the purpose of an easy removal of the parts for inspection, cleaning, and removal.

29,350.—M. H. Bacon, of Mystic, Conn., for an Improvement in Machines for Dressing Millstones:

I claim, first, The arrangement of the band wheel, G, sliding frame, E sleeve, E′, spring, J, and suitable means for adjusting the tension of J, and suspending the spindle, K, by turning G, substantially as set forth.

Second, Operating the stop, T, by the pawl, N, substantially in the manner shown, for the pur ose of seizing and holding up the cutters by a slight motion of the wheel, G, whatever may be the tension of the spring.

Third, The slide, R, spring, U, slide, T, and grooved spindle, F K, in combination with the shifting device, M N, e r, or its equivalent, substantially as and for the purpose set forth.

Fourth, The arrangement of the spring, U, in connection with the double slide, R T, and band-wheel, G, substantially as shown for the purpose specified.

29,351.—H. L. Bennett, of Long Branch, N. J., for an Improvement in Machines for Covering Potatoes:

I claim the triangular moldboard, f, provided with the shares, k k and i, and adjustable, relatively to the beam, a, by the bars, g h, substantially as and for the purposes set forth.

And, in combination with the aforesaid triangular moldboard, I claim the harrow, l, attached to the bar, m, and to said moldboard, f, in the manner and for the purposes specified.

29,352.—Cornelius Bergen, of Farmer, N. Y., for an Improvement in Grain Separators:

I claim, first, The combination of the fingers, 4 4, receiving the grain from the first carrier, the rake, 5 6 7, and the carrier, 11, substantially as and for the purpose set forth.

Second, The arrangement of the rake, 5 6 7, in connection with the vibrating bearings, 8 8, and craft shaft, 9, in the order and manner described—that is to say, the crank shaft being placed between the rake-head, 6, and the vibrating bearings, by which a greater and more perfect agitation of the straw and clearance of the rake is secured by means of the greater vertical than horizontal motion given to the rake.

29,353.—L. R. Billard, of Norfolk, Va., for an Improvement in Ratchet Drills:

I claim the arrangement of the shank, B, the box, A, the screw, D, the ring, c, the spring, a, and the handle, H, the screw, D, passing into the shank, a portion of the shank passing into the box with the spring, a, intervening between them and the handle, H, being secured to the box, as represented, the whole being combined, constructed and operated, as and for the purpose specified.

29,354.—Wm. H. Bishop and A. H. Low, of Warren, Mass., for an Improvement in Devices to Prevent Horses from Cribbing:.

We claim so combining the pivoted or hinged guard, D, with the strikers, l, through the arms, h, and clutch, r, as that any attempt to grasp the top of the guard will throw up the strikers, and give the horse a blow on the nose, and thus cause him to desist from any attempt at cribbing, as set forth and explained.

29,355.—J. H. Boardman, of New York City, for an Improvement in Steam Boilers:

I claim, first, The arrangement and combination of the circular central neck, E, horizontal boiler, A, vertical tubular boiler, F, and surrounding dropflue, G, operating substantially as and for the purpose set forth.

Second, The combination with the vertical tubular boiler, F, of a mud-box, K, constructed and operating substantially in the manner and for the purpose specified.

[This invention consists in connecting a horizontal cylinder and a vertical cylinder by means of a central neck in combination with a flue surrounding said vertical cylinder in such a manner that the vertical cylinder shall be suspended when set, and that the heat from the furnace passes under the horizontal cylinder which forms the top of the furnace, thence through and around the vertical cylinder, whereby a large amount of heating surface is obtained at a comparatively small expense. A mud-box at the bottom of the vertical cylinder serves to collect the impurities which may precipitate from the water.]

29,356.—Nathan Brasher, of Green Fork, Ind., for an Improvement in Bee-hives:

I claim the arrangement of the metallic ribs and metallic bottom within the moth drawer, as and for the purpose shown and described.

29,357.—James Brooks, of Romulus, N. Y., for an Improvement in Ditching Plows:

I claim the combination and arrangement of the guide bar and coulter share, substantially as described and set forth.

29,358.—T. H. Burridge, of St. Louis, Mo., for an Improvement in Steam Plows:

I claim the combination of the gang of plows, S S S, with the described drum and engine, in the manner described.

29,359.—J. W. Cliff, of Rochester, N. Y., for a Register Point:

I claim the application to Adams' printing-presses, or any other description of printing-presses to which they may be adapted, points that can be moved in any desired direction within a given space, by the means and in the manner described.

29,360.—Loring Coes and A. G. Coes, of Worcester, Mass., for an Improved Machine for Heading Screw Wrenches:

We claim, first, The combination of the anvil block, O, side dies, c c, gage, p, and hammer die, e, for the purpose of forming and heading the blanks of screw wrenches, substantially as described.

Second, We claim, in combination with the hammer die, e, and the anvil block, a gage for defining the relative positions of these parts, with regard to the blank, for the purpose of "paring" down the thin part of the jaw of the wrench blank, substantially as described.

Third, We claim, in combination with a hinged catch, g, the foot lever or treadle, K, for catching and holding up the hammer, substantially as described.

Fourth, We claim, in combination with the catch and its sliding-piece, l, a tripping arm on the cam, so that the hammer, when tripped, will not fall upon the cam, substantially as described.

29,361.—J. W. Covel, of Bangor, Me., for an Improved Harness Buckle:

I claim, as an improved article of manufacture, a buckle having a frame, a, loops, a c, and tongue, d, arranged and constructed as shown and described.

[The object of this invention is to obtain a buckle that will not weaken the harness in being applied to the same, and also one that will admit of a quicker adjustment than usual of the straps or parts which the buckle connects.]

29,362.—Florian Dahis and Frederick Doermer, of Brooklyn, N. Y., for an Improvement in Catamenial Bandages:

I claim a menstrual instrument composed of a cup, B, springs, D E, and a main or girdling spring, A, the parts being made and confined as shown and described.

29,363.—John Dain, of Utica, Ohio, for an Improvement in Compositions for Preservation of Timber:

I claim the mode of preserving wood from rotting, by means of the described composition being inserted therein, as described, or in any other way.

29,364.—J. H. Davis, of Woburn, Mass., for an Improvement in Warming Apparatus:

I claim the construction and use of the horizontal reverse draft flue K K, with its fixed partition, H, its swinging partition, N, and jointed lever, I, and two vertical partitions, S S, and their valve, U, together with the inclined partition, A, as combined with the radiator, R, when arranged and combined in the manner and for the purposes specified.

29,365.—Joseph Desnos, of Troy, N. Y., for an Improved Horse-shoe Machine:

I claim, first, The combination of the segmental roller, A, and friction roller, A′, with the cutters, B B′, the whole being arranged and operating together as described, to intermittingly feed in and cut off the heated iron bar.

Second, I also claim the combination of an intermittingly-revolving anvil, E, provided with a series of equi-distant female shoe dies or molds, f, each having a core, g, which projects beyond the mold, as described, with a vibrating die or hammer, D, and a pair of vibrating jaws, C C; the whole arranged and operating together substantially as described, to bend and swage the pieces of the heated iron bar into the form of the shoes.

Third, I also claim the reciprocating creasing die, H, when arranged and operating in combination with the intermittingly-revolving anvil, E, the hammer, D, and the jaws, C C, as described, to successively and automatically forge and crease the shoes.

Fourth, I also claim the combination of the vibrating nail hole punch, I, with the intermittingly-revolving anvil, E, creasing die, H, hammer, D, and jaws C C, all arranged and operating together substantially as described, for the purpose of successively bending, swaging, creasing and punching the shoes at one continuous mechanical operation.

Fifth, I also claim the vibrating tongue, J, when arranged and operating as described, to discharge the shoes from the molds of the intermittingly-revolving anvil.

29,366.—Levi Disbrow, of Oswego, N. Y., for an Improvement in Apparatuses for Destroying Vermin:

I claim the combination of the pipes, c and E, with the reservoir, B, rim, C, valve, a, and bellows, A, as and for the purposes set forth and described.

29,367.—Lockwood Drake and E. Hewett, of Marshall, Mich., for an Improvement in Smut Machines:

We claim the use of the auxiliary fan blower, P2, in combination with the semi-annular passage, O, when applied substantially in the manner and for the purposes described.

29,368.—Ezra Emmert, of Franklin Grove, Ill., for an Improvement in Cultivators:

I claim the combination, with an ordinary shovel plow or cultivator, A, of the rotary wheel, F, furnished with hoes, b, and operating in the manner and for the purpose specified.

[This invention consists in the combination, with an ordinary shovel plow or cultivator, of a wheel rotating on the side of the plow, and provided with hoes on its edge for the purpose of preventing the plow from covering the growing plants as it is drawn forward, and also for the purpose of giving steadiness to the plow and to enable the attendant to guide it more readily, and at the same time for the purpose of digging up and pulverizing the soil around the roots of the growing plants.]

29,369.—Benaiah Fitts, of Worcester, Mass., for an Improved Planing Machine:

I claim, first, The arrangement of the screw, O, the hanger, N, the box, M, and the spring, R, in combination with the dimension planer, when constructed and operating substantially as set forth.

Second, I claim so hanging or fastening the stand by which the pressure roll is attached to the cylinder frame, D, in such a manner that the pressure of the roll on the board will serve to hold or bind the cylinder frame more firmly to the sides or posts, substantially as described.

Third, I claim hanging the pressure bar, S, in such a manner that its pressure upon the board will cause it to hold the cylinder frame, D, more firmly to the slides or posts, substantially as set forth.

Fourth, I claim so forming and hanging the pressure bar, S, or its mechanical equivalent, that the backward motion of the carriage will raise the cylinder frame, D, so as not to plane or mark the board while running back.

29,370.—Elisha French, of Braintree, Mass., for an Improvement in Apparatuses for Rescuing Horses from Fire:

I claim the combination and arrangement of the rope, H, spring latch, D, connecting chain, f, halter ring, g, and sliding bolt, C, substantially as described and for the objects specified.

29,371.—Frederic Gardiner, of Gardiner, Maine, for an Improvement in Mowing Machines:

I claim, first, The combination of a hollow cutter bar, G, set inclined downward from its rear edge, circular plane edged overlapping cutters or shears, J J, cogged gearing, I I N, for actuating said cutters, J, longitudinal shoe, K, with slotted standards, c c, two caster wheels, L L, long vertical pinion, M, for receiving and transmitting the power, vertical guide pins, L′ L′, swing frame, O O′, toothed driving wheel, C′ D, and intermediate pinions, S T, substantially as and for the purposes set forth.

Second, So combining the cutter bar, G, with all its attachments, with the main frame, A, and the gearing thereof by means of vertical pins, L′ L′, and a swing frame, O, having a swiveling bar, O′, or by equivalent devices, that the cutting apparatus may be thrown out of gear; and also, when desirable, the cutter bar, with all its attachments, may be entirely disconnected from the main frame, substantially as set forth.

29,372.—P. W. Gates, of Chicago, Ill., for an Improvement in Casting Stamping Heads:

I claim the use of a hollow central chill in combination with an external chilled metal flask, in the manner substantially as and for the purposes described.

29,373.—Justus Griggs, of Utica, N. Y., for an Improved Machine for Making Screws:

I claim the employment of a movable gage plate, substantially as described, in combination with the transferring fingers, substantially as described, for gaging the screw blanks by the head when the blanks are inserted in the griping jaws, as set forth.

29,374.—Ira Hart, of Clarksburg, Va., for an Improvement in Machines for Threshing and Cleaning Grain:

I claim, first, The scrapers, k, which sweep the lower screen, when constructed with three sides and arranged as shown for the purpose set forth.

Second, The combination of a stationary adjustable straw-arrester, N, with a swinging one, M, in the cap, O, of the machine, as set forth.

29,375.—David Hinman, of Berea, Ohio, for an Improved Mode of Forming the Center for the Shaft of Grindstones:

I claim an apparatus for making the eye of a grindstone concentric with its periphery by means of the screws, D, studs, L, and the pin, K, which pin is placed in the rough eye of the stone, and in the center of the circle formed or bounded by the circumference of the stone, and filling the rough eye around the pin, K, with some plastic cement, through which the crankshaft is subsequently inserted, substantially as described and for the purposes specified.

29,376.—Wm. Hoffmire, of San Francisco, Cal., for an Improvement in Apparatuses for Boiling and Distilling:

I claim the combination of furnace, A, water jacket compartments, r s, circulating pipes, t u, and regulating cocks, O O, with two boilers, B C, and double cover, E, all constructed in the manner and for the purposes set forth.

29,377.—James Jackson, Jr., of Westerly, R. I., for an Improvement in Oil Cans:

I claim the oil passage, M, hollow space, N D, open at each end, and vent tube, E, combined and arranged substantially as and for the purpose set forth.

29,378.—E. C. Jenkins, Jr., of Springfield, Mass., for an Improvement in Skates:

I claim the two clamp plates made to fit within a recess in the upper part of the foot-rest (and to clasp the sole of the boot alone), in connection with a leather strap and buckle to pass over the foot and confine it down upon the foot-rest, the protecting plate, l, and the sustaining screws, k k′, the particular object of the clamp plates in my invention being to bring the foot of the wearer either to one side or the other of the center of the iron runner, and to prevent any lateral slipping of the foot on the foot-rest, in manner and for the purpose as described.

I also claim the peculiar construction of the underside of the runner, B, with its narrow groove, m, on its inner edge, and its wide, flat or convex bearing surface, n, essentially in manner and being made to operate as described.

29,379.—J. E. Johnson, of Brockport, N. Y., for an Improved Device for Heating Smoothing-irons:

I claim the arrangement of the revolving plate, H, and smoothing irons, K K, substantially as and for the purposes specified.

29,380.—W. F. Johnson and J. Doyle, of Wetumpka, Ala., for an Improved Blind Slat Machine:

We claim, first, The adjustable tooth rack, R, constructed substantially as shown, to wit, the teeth, i, being fitted loosely in a grooved plate, I, and adjusted through the medium of the eccentric segments, j′, bar, K, and bars, m′, or their equivalents, for the purpose of varying the length of the spaces between the mortises and holes of the slides, as set forth.

Second, The combination of the adjustable tooth rack, R, and the auger arbor, C, when operated simultaneously through the medium of the sliding bar, F, slotted plate, H, pawl, m, and treadle, G, arranged substantially as and for the purpose set forth.

Third, The reciprocating arbor, O, provided with awl, g″, in connection with an adjustable tooth rack, R, for the purpose specified.

Fourth, The endless belt, T, arranged relatively with a hopper, S, and provided with hooks, t′, in connection with the curved stripping plate, w′, for the purpose of taking the staples from the hopper and feeding them to the staple-driver, W, as described.

Fifth, The arrangement of the bar, X, to which the driver, W, is attached, cylinder, Z, provided with arms, x′, the stationary projections, x″, in the box, V, together with the spring, y′ z′, to give the lateral motion to the driver, to admit of the staples passing below it to be driven, as set forth.

29,381.—Wm. Johnson and H. Wansbraugh, of Cincinnati, Ohio, for an Improvement in Cooking Stoves:

We claim the aarangement of the grate, C, arching fire and oven plates, A B, flues, F G, and damper, H, constructed and combined in the manner and for the purposes set forth.

29,382.—J. H. Kalb, of Charleston, S. C., for an Improvement in Street Lights:

I claim the employment of the lamp, D, provided with gas burners, F F, and reflectors, G G, when the same is used in connection with the gas pipe, E, posts, A, and the rods or bar, C C, and the whole arranged as and for the purpose specified.

29,383.—W. A. Keeler, of New York City, for an Improvement in Preserving Food:

I claim the use of two casks with the intermediate filling of plaster, when they are so arranged that the inner cask shall be perfectly insulated by the plaster, substantially as and for the purpose specified.

29,384.—S. M. King, of Lancaster, Pa., for an Improved Steam Cross-cut Sawing Machine:

I claim, first, Pivoting the guide frame, a, which bears the steam cylinder, b, and the cross-head of the saw, at a point intermediate between the steam cylinder and the cross-head of the saw.

Second, In combination with such mode of pivoting the frame, I claim arranging the feed movement so that it shall operate at the point of suspension of frame, a, as set forth.

Third, Supporting the steam cylinder and the entire framework upon the two uprights, c c, as set forth.

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29,385.—Jacob Kinzer, of Pittsburgh, Pa., for an Improvement Sausage-stuffer:

I claim constructing a sausage-stuffer with a body or box having its interior the shape of the sector of a cylinder, and having a pressing flap hinged or pivoted at the center of the cylinder of which the body is a sector, substantially in the manner and for the purposes described.

I also claim combining with a body and pressing flap, such as described, a nozzle opening into one of the radial sides of the sectional body or box at an acute angle thereto, so as to present a large opening for the passage of the meat without increasing the diameter of the nozzle, substantially as described.

29,386.—Ernst Kirsch, of New Haven, Conn., for an Improved Carriage Body:

I claim the construction of the crooked or curved body when no more than two pieces are used to compose the two sides of the body and the seat rail, while the fibers of the timber always run in the direction of the curves or sweeps, so that no part is in any degree cut across the grain of the timber, and the whole is constructed and fitted for use substantially as described.

29,387.—Henry Kurth, Florian Davis and Charles Robitaille, of Brooklyn, N. Y., for an Improved Tobacco Box:

We claim the arrangement and combination of the revolving bottom, B, sweep, d, stationary body, A, and partition, a, constructed and operating substantially as and for the purpose specified.

[This invention consists in arranging the bottom of the box together with a sweep attached to the same, in such a manner that the same rotates on a central pin, and that the tobacco in the box can be compressed between said sweep and a stationary radial partition, which is secured to the body of the box by a direct positive pressure.]

29,388.—E. W. Lacy, of Oak Park, Va., for an Improvement in Hemp Brakes:

I claim, first, The employment, in combination with the crushing rolls, C C', and striker roll, D, of an inclined reciprocating separator, F, the whole arranged and operating as specified, for the purpose set forth.

Second, I claim the combined arrangement of the crushing rolls, C C', striker roll, D, guide rest, E, inclined separator, F, and discharge apron, P, the whole constructed to operate as specified, for the purpose set forth.

29,389.—Z. W. Lee and E. D. Lee, of Blakely, Ga., for an Improvement in Cultivators:

We claim the combination of a plow beam, b, and three angle irons, e e' e e' e e', with a cutter, c, plow share, d, plow brace, i, clamps, g, and wedges, h, when constructed and arranged in the manner and for the purposes set forth.

29,390.—A. C. Lewis, of Burlington, Mich., for an Improvement in Fruit-drying Apparatuses:

I claim the arrangement and combination, in the manner shown and described, of the elevating platform, C, fruit racks, J, bars, F, endless band, I, with the shaft, D, pulleys, E b b, lifting ropes, a c, and house, A, so that, by turning the shaft, D, the fruit will be raised and carried out of the house and exposed to the sun and air, and on reversing shaft, D, the fruit will be again deposited within the house, all as set forth.

[This invention consists in the employment or use of a series of fruit racks, combined and arranged in such relation with a suspended platform, an endless rope or band, a track or way and a suitable house or covering, that, by the turning of a shaft, the fruit racks may be automatically moved out on the track and exposed to the sun and air, and also automatically moved within the house under cover, as occasion may require.]

29,391.—W. C. Lostutter and S. Wolcott, of Rising Sun, Ind., for an Improvement in Cultivators:

We claim the arrangement of the adjustable clamp, G', swinging arm, G, guard, K, wing, L, beam, A, brace rod, E, standard, B, pivoted handle, D D, cross brace, D', sector plate, a, and strap, b, as and for the purpose shown and described.

[This invention consists in combining, in a novel manner, with a shovel or cultivator plow, an adjustable shield or wing, which is so attached to the beam of the plow that it will rise and fall and accommodate itself to the inequalities of the surface of the earth; said wing or guard is for the purpose of protecting the young and tender plants from being entirely covered up with earth loosened by the shovel; and where the plants are older, it is desirable to keep the earth raised by the shovel from being thrown about their roots, which would prevent a proper circulation of air and also the admission of moisture to their roots. The rear end of the plow beam is also constructed so that the weeds, &c., will not be clogged up by it, at the same time the requisite strength may be obtained.]

29,392.—A. D. Lufkin, of Cleveland, Ohio, for an Improvement in Preparing Hides:

I claim the composition made as set forth and for the purpose described.

29,393.—P. Martin, of New Orleans, La., for an Improvement in Cotton Seed Hullers:

I claim the employment of prismoidal reversible bar knives, a, in combination with the scored hulling cylinder, A, and scored concave, B, as and for the purpose shown and described.

[This invention is a novel manner of securing the teeth or hulling knives into the concave and cylinder so that they will be securely held in place, and so that they may be removed and reversed when one side becomes much worn. In this way they become self-sharpening, and can always be kept in a fit state for effecting the separation of the hullf from the kernels by a culling action.]

29,394.—Matthias M'Gonnigle, of Alleghany, Pa., for an Improvement in Bee-hives:

I claim, first, The use of the movable sides, d, when used in connection with the inner chamber or chambers of the beehives, as described, and for the purpose set forth.

Second, The use of the double and perforated cover, when arranged and constructed as described and for the purpose set forth.

29,395.—J. P. Mendenhall, of Farmington, Ill., for an Improved Car Coupling:

I claim the stock, A, provided with the projections, a a, and the cylindrical projection, b, having the head, c, at its end, in connection with the bar, B, having the bars, C C, attached to it by joints, d; the spring, D, being between them, and provided at their outer ends with the jaws, e e', and projections, h h, substantially as and for the purset forth.

[This invention has for its object the prevention of accidents on railroads produced by the throwing of the locomotive or any of the cars of a train from the track, a contingency of frequent occurrence, caused by obstructions on the track, the displacement of rails, &c.]

29,396.—George Munce, of St. Louis, Mo., for an Improved Apparatus for Cleaning Windows:

I claim the adjustable standard, E B, in combination with the platform, A, or its equivalent, when the same is operated substantially as described, for the purpose set forth.

29,397.—John Park, of Joliet, Ill., for an Improved Churn:

I claim, first, The arrangement of the bars, E E, on the under side of the hinged lid of the churn, in combination with the revolving shaft of beaters, in the manner and for the purpose described.

Second, The conical gudgeon, C, fitted in a conical seat and acted upon by the spring, D, in the manner and for the purpose described.

Third, The hair-catching strips, d, attached to the bars, E, in the manner and for the purpose described.

29,398.—J. M. Patterson, of Woodbury, N. J., for an Improved Construction of Lightning-rods:

I claim making the lightning-rod, D, and waterspout or leader, B, of one continuous piece of metal, so constructed and arranged that they will perform the double function of conductor and waterspout, as set forth.

29,399.—Edward Peach, of Utica, N. Y., for an Improvement in Awning Fixtures:

I claim the arrangement of the hinged struts, H, plate, G, hooks, i, awning, D, roller, C, spring, F, ratchet, e, and pawl, f, as and for the purpose shown and described.

[This invention has for its object the ready adjustment of awnings over the doors and windows of stores and dwellings, by a simple and efficient means that may be economically adapted and not be liable to get out of repair or become deranged by use.]

29,400.—J. G. Perry, of South Kingston R. I., for an Improved Meat-cutter:

I claim the employment of the knives and pendants combined substantially as described and for the purposes set forth.

29,401.—A. H. Phillippi, of Reading, Pa., for an Improvement in Gas Regulators for Railroad Cars:

What I claim is: In combination with the plane, disk, spring plates, a a', and their inclosed space, the valve, e, with its washer, f, flat space, g, and openings, h i, for the purpose of regulating the flow of gas from the receiver to the burners, whatever may be the pressure upon the gas, substantially as herein described and represented

29,402.—James Radley, of New York City, for an Improvement in Lamps for Locomotives:

I claim, first, The division of the oil reservoir, by means of horizontal diaphragms or partitions, into several shallow compartments or sub-divisions, substantially as described.

Second, The wash hole with its closing cap or plug, in combination with the horizontal compartments or sub-divisions of the reservoir, by means of which access is had, at once, to all the said compartments, substantially as set forth.

Third, In combination with the said horizontal compartments or subdivisions, the oil duct or tube by which the oil is conveyed into the lowermost sub-division of the reservoir, together with the air vents chamber and its checks by which the oil is retained while the air is permitted to pass out of or into the reservoir as required, substantially as described.

29,403.—J. C. Rainbow, of New Brighton, Pa., for an Improvement in Belt Trusses:

I claim the employment, in connection with the pads, A A, of the straps, d d h h n k k l o o p p r r, and connecting and adjusting buckles; the whole combined and arranged substantially as specified, or one pad only, when two are not necessary.

[This invention consists in an arrangement of straps whereby the pads are kept in place with a properly-regulated pressure, without the use of springs, and the pressure is caused to adapt itself to the strain to which the body is subject during any exertion.]

29,404.—Joseph Renard, of Lyons, France, for an Improvement in the Preparation of Aniline Colors:

I claim combining with aniline the metallic salts specified or their equivalents, and treating the same in such a manner as to produce a red, in contradistinction to a purple or bluish coloring matter or dye, substantially as set forth.

29,405.—James Rogers, of Santa Clara county, Cal., for an Improved Machine for Forming Stove-pipes:

I claim, in combination with a stove-pipe-forming machine, a box, G, the diagonal corners, e e', are beveled, and a slip, H, arranged in the manner and for the purpose set forth.

29,406.—Frederick Roos and Fr. Spoehr, of New York City, for an Improved Padlock:

We claim, first, The employment, for the purpose of retaing the padlock to a door, of a hooked pin, A, passing through the keyhole of the ordinary lock and catching on the inner side of the same, substantially as and for the purpase specified.

Second, The arrangement and combination of the nooked pin, A, sliding barrel, C, locking plate, E, hollow stem, B, and spring catch, h, constructed and operating substantially in the manner and for the purpose set forth.

Third, The combination with the hollow stem, B, and spring catch, h, of a spring dog, i, arranged substantially as and for the purpose described.

Fourth, The arrangement of a pin, o, sliding in a hollow tube, q, and in combination with the dog, i, and catch, h, constructed and operating as and for the purpose specified.

29,407.—F. M. Ruschhaupt, of New York City, for an Improvement in Apparatuses for the Manufacture of Vinegar:

I claim the arrangement of the annular passages, c, tube, e, vessel, B, pipe, f, cask, C, and tube, g, in combination with the acidifiers, A, constructed and operating substantially in the manner and for the purpose set forth.

[This invention consists io connecting the stills or acidifiers with a closed cask or vessel containing water, in such a manner that, as the water is let out of the last-named vessel, the air is made to pass through the acidifiers with more or less rapidity, according to the quantity of water discharged from the cask in a certain time, so that the force of the current of air passing through the acidifiers can be controlled at pleasure.]

29,408.—S. T. Russell, of Ottawa, Ill., for an Improvement in Rotary Engines:

I claim, first, The combination of the flanged pistons, the piston boxes, the cavities, 10 and d d, in the cylinder, and the passages, 11 12 13 14 15, in the cylinder and wheel—the whole operating substantially as and for the purpose specified.

Second, The plates, G G, constructed and applied to the steam wheel substantially as described, and serving the double purpose of securing the same in the cylinder and of cams to operate the cut-off valves.

Third, The system of levers, T U T* U*, applied in combination with the plates, G G, and with the cut-off valves substantially as described, to effect the operation of the said valves.

Fourth, In connection with the two sets of induction and eduction ports in the cylinder, the connected reversing valves, N N' O* O*, constructed, applied and operated as described.

[This invention consists in an improved construction of, and mode of applying, the sliding pistons of a rotary engine, and in an improved system of steam and exhaust passages for effecting the movements of the pistons toward and from the axis of rotation of the engine. It also consists in certain improved means of operating a system of cut-off valves for the purpose of using the steam expansively in a rotary engine; and it further consists in an improved system of reversing valves.]

29,409.—J. B. Shafer, of Grafton, Va., for an Improved Railroad Cattle Car:

I claim the combination, with the car body, of a raising and lowering middle deck proper and suitable hoisting machinery thereto, in such manner as that the car may readily be converted from a double decker into a single-floor, cattle, or open-space, or freight car, free from division into stall apartments or projecting arrangement of partitions into stalls, substantially as specified.

Also, The combination, with the raising and lowering middle deck to the car, of independent stalls or stall partitions hinged or otherwise equivalently-connected to the car on opposite sides of it at opposite ends, and for operation in connection with the adjustable middle deck but distinct therefrom, substantially as and for the purpose or purposes specified.

29,410.—D. L. D. Sheldon, of San Francisco, Cal., for an Improvement in Hernial Spring Trusses:

I claim, as a new article of manufacture, an abdominal truss combining, in its construction, a pad with a cushion, A, and plate, C, a compress or ball, B, sliding plate, D, and spring, H, and applied in the manner and for the purpose set forth and described.

29,411.—Rufus Simonds, of Ludlow, Vt., and G. W. Goodspeed, of Winchendon, Mass., for an Improvement in Machines for Making Wooden Bowls:

We claim the attaching the radius arm, G, of the carriage, F, to a sliding or adjustable block, H, in connection with the auxiliary cutter, q, attached to the carriage; all being arranged in relation with the mandrel, C, and bolt, D', to operate as and for the purpose set forth.

29,412.—Christopher Smith, of Nauvoo, Ill., for an Improvement in Corn Planters:

I claim operating the feed bar, k, by means of the handles, d, clevis, f, and bent lever, g—all being constructed and arranged substantially as described for the purposes set forth.

29,413.—Jesse Speer, of Hazlehurst, Mass., for an Improvement in Cotton Cultivators:

I claim the combination of the wheel, a, hoe, h, and bar, I, arranged and operated as or substantially as and for the purpoee set forth.

29,414.—G. S. G. Spence, of Boston, Mass., for an Improved Boiling and Condensing Apparatus:

I claim the construction of the water joint by means of the combination of the side, a a', with the side, b b', in the manner and for the purpose substantially as set forth.

29,415.—W. W. Stannard, of Buffalo, N. Y., for an Improved Refrigerator:

I claim the arrangement of the air tube, F, passing through or near the ice box, B, and through the water tank, D, and opening into the preserving room at its lower end for the purposes and substantially as set forth.

29,416.—G. A. Stanley, of Cleveland, Ohio, for an Improvement in Apparatuses for Molding Candles:

I claim the special arrangement of the molds in a circular form, in combination with a frame or box suitable for the purpose, in the manner and for the purpose substantially as described.

29,417.—Henry Sweetapple, of Napa, Cal., for an Improvement in Fan Blowers:

I claim the combination of two rings, e e, of flexible material, with the air-chamber, a, and the sides, B B, of a fan blower, constructed as above set forth, in the manner and for the purpose described.

29,418.—E. C. Thompson and M. B. Wheaton, of New York City, for a Box for Silvering and Albumenizing Photographic Paper:

We claim silvering or albumenizing photographic paper by means of a box fitted so as to be revolved or inverted, for the purposes and as set forth.

20,419.—Wm. Thomson, of Buffalo, N. Y., for an Improved Nail Brush:

I claim the circular brush and cup combined substantially in the manner and for the purposes set forth.

29,420.—D. J. Vail, of Industry, Ill., for an Improvement in Seeding Machines:

I claim the arrangement of the curved, connected, covering shares, K K, furrow shares, I I, tube, I, colter, J, frame, A, and box, D, wheels, a a, seat, B, uprights, G G, slide, F, pins, g, seats, E, and bar, H, as and for the purpose shown and described.

[This invention relates to an improved seeding machine of that class used for planting seed in hills and having the same in check rows. The invention consists in a peculiar arrangement of means for operating the seed slides and enabling the operator to cause the seed to be dropped at the proper points to insure the hills being formed in check rows. It also consists in a novel arrangement of parts for properly furrowing the ground to receive the seed and for properly covering the same as dropped.]

29,421.—Isaac Van Bunschoten, of New York City, for an Improvement in Vapor Lamps:

I claim, first, The relative arrangement of a supply tube, V, inclined conducting tube, A, inclined return tube, B, a heater, D a, a tubular burner, I, regulating valve, H, and air passages, U U, substantially as and for the purposes set forth.

Second, The arrangement of the two inclined tubes, A B, with respect to the heater, D a, and single-screw plug, C, of the heater, D a, substantially as and for the purposes set forth.

Third, The arrangement of the conical screw plug or valve, H, constructed with the cylindrical screw nut, R, in combination with the lower end of the vapor burner, substantially as and for the purposes set forth.

29,422.—A. H. Wagner, of Staunton, Va., for an Improvement in Mills:

I claim the combination of the hoop, b, collar, R, and case, N'—the whole being constructed and arranged substantially as described.

29,423.—J. B. Wands, of Memphis, Tenn., for an Improved Fabric for Roofing, Belting, &c.:

I claim, as an improved article of manufacture, the within-described fabric made of canvas and the residuary gum of stearic acid, as set forth.

[This improved fabric consists of canvas or other woven goods saturated with what is known to manufacturers of stearic acid as "residuary gum," that is to say, the residuary pitchy matter resulting from the manufacture of such acid.]

29,424.—Chapman Warner, of Brooklyn, N. Y., for an Improvement in Pumps:

I claim adjusting the pump cylinder, A, at the proper hight by means of the pendants, q, slats, c, and their attachments, as and for the purposes described.

29,425.—F. W. Warner, of East Haddam, Conn., for an Improvement in Mowing Machines:

I claim the combination of the frame extending in front of the main axle with the draft frame, or thills, driver's seat and cutting apparatus, the front end of the frame, D, serving as a treadle to elevate the cutting apparatus, and the several parts being constructed and arranged in the manner described.

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29,426.—Jonathan Warren, of Brooklyn, N. Y., for a Pen-holder:

I claim the employment of an elastic tube, C, constructed as described in combination with the pen-holder, A, for the purpose of forming a shield for the pen.

[This invention consists in the employment of an elastic tube in combination with an ordinary pen-holder in such a manner that said tube allows of sliding over the pen-holder or that the pen-holder can be slid back into the tube, thereby producing a cheap, self-adjusting and efficient shield or protection for the pen.]

27,427.—L. R. Wattles, of Newton, Mass., for an Improvement in Looms:

I claim my improvement in regulating the tension of the warp of a loom, the same consisting in so combining the yarn beam with friction apparatus, as described, that the gravitating power or weight of the yarn on the beam, as such power or weight may diminish during the unwinding of the yarn on the beam while the weaving process is being carried on, shall operate to decrease the friction on the beam.

I also claim the arrangement of the yarn beam and the lever of the above-described friction apparatus applied, by gearing or its equivalent, to the yarn beam as described.

29,428.—W. S. Williams, of Lynn, Mass., for an Improvement in Machines for Skiving Leather:

I claim the combination and arrangement, as described, of the bent wires, F F, swinging frame, D, slots, g g, and nuts, f f, for the object specified.

29,429.—Horace Wing, of Buffalo, N. Y., for an Improvement in Machines for Crimping Leather:

I claim the arrangement with the frame, A a b c, and crimping jaws, B B, of the pivoted crimping bar, C, which has a toothed segment, F, on its front end, and the continuously-revolving cog wheel, H, in the manner and for the purpose described.

29,430.—Nathan Ames, of Saugus Center, Mass., assignor to himself and E. M. Montague, of Boston, Mass., for an Index Door Plate:

I claim, first, The removable plate, I, of ivory, porcelain, slate or other material capable of being written upon with a pencil and the writing readily expunged, in combination with a suitable frame or door plate furnished with a glass protector, G, and confining said removable plate by means of a spring bolt, D, or its equivalent passing through the door, substantially as set forth and for the objects specified.

Second, In combination with the above door plate, a rotating disk, C, marked with the hours and parts of an hour, as shown in Fig. 2; said disk being confined in the center to a spindle, D, which passes through the door, substantially as and for the purpose described.

Third, The spring, S, arranged, combined and operating substantially as described.

29,431.—Thaddeus Fowler and De Grasse Fowler, of Northford, Conn., assignors to the United States Pin Company, of Seymour, Conn., for an Improved Machine for the Manufacture of Pins:

We claim, first, The spring finger, i, within the clamping jaws, for the purpose and as specified.

Second, The combination of the cutter, 7, and toe, 8, with the finger, i, for carrying the headed pin out of the clamping jaws and delivering the same into the notched pin wheels, o o, as set forth.

Third, A rolling bed, in combination with a stationary, resisting surface and cutter or cutters, when said cutter or cutters act on the same side of the shaft of the pin as the stationary surface against which the pin rolls in being pointed, for the purpose and as set forth.

Fourth, The notched pin wheels, o o, and revolving and rolling bed, n, constructed and operating substantially as set forth.

Fifth, The metallic strip, p, kept at a proper tension by the lever, 16, or its equivalent and pressing the belt, 17, on to the pins, in combination with the rolling bed and notched plates, as and for the purposes specified.

Sixth, The arrangement of the reciprocating cutters, s s and t t, combined with the rolling bed as described and shown.

29,432.—G. E. Frew, of Brooklyn, N. Y., assignor to Wm. Richardson and John Richardson, of New York City, for a Pen and Pencil Case:

I claim the arrangement, as shown and described, of the spirally-slotted tube, C, pencil slide, B, upon the inside of tube, C, and pen-holder tube, E, upon the outside of tube, C, so that the same tube, C, and the same spiral slot will move both the pen and pencil in either direction as required—all as set forth.

[This invention consists in the employment of a pencil slide, a spirally-slotted tube and a pen slide attached to a longitudinally-slotted tube; the said parts are arranged, combined and placed within an external case in such a manner that a very portable, simple and durable extension pen and pencil case is obtained.]

29,433.—F. A. Goddard (assignor to himself and J. H. Kennaday), of Lexington, Ill., for an Improvement in Corn Planters:

I claim the arrangement of the shifting wheel, H, on shaft, G, with the permanent wheel, F, on the axle, C, in combination with the removable lever, S, in shaft, G, as and for the purpose set forth.

[The object of this invention is to obtain a simple and efficient machine that may be readily adapted for planting corn in drills or check rows—one that may be readily manipulated and be under the complete control of the driver.]

29,434.—E. L. Harlow (assignor to W. G. Brown), of Monmouth, Me., for an Improved Pegging Jack:

I claim the application or arrangement of the spring, F, with respect to the post, A, and the heel lever, D, and so as to operate substantially as specified.

29,435.—Lewis Jennings, of Brooklyn, N. Y., assignor to himself and R. Dickinson, of New York City, for an Improvement in Cotton-pickers:

I claim the employment of the spur wheel, D, in combination with belts, E, which pass between the spurs, a, so that as the spurs sink between the belts, the cotton will be stripped from the spurs and left upon the belts—all substantially as shown and described.

29,436.—Isaac Lindsley, of Providence, R. I., assignor to himself and D. F. Tompkins, of Newark, N. J., for an Improvement in Segars:

I claim the hydraulicising or condensation of tobacco to the highest possible extent into the form of a segar or other form suitable for smoking (Fig. 1), when the tobacco so hydraulicised or condensed shall have, running in and through the same, the distinct aperture, a (Fig. 2), or its equivalent, formed substantially in the manner and for the purposes described.

29,437.—J. A. Matthews (assignor to himself and S. H. Hemphill), of St. Louis, Mo., for an Improvement in Repeating Ordnance:

I claim, first, The use of the revolving breech, B, when it is arranged horizontally and operated by means of the circular rack, Q, pinion, Y, and shaft, r, arranged as shown and described.

Second, I claim the use of the cartridge-receiver, e, when it is arranged with reference to the revolving breech, B, in the manner described; and—

Third, I claim the use of the rammer, f, when it is arranged and operated with reference to the receiver, e, and breech, B, in the manner described.

29,438.—Samuel Man (assignor to H. T. Man), of Chicago, Ill., for an Improved Ore Separator:

I claim the construction and arrangement of the conical elevating and discharging wheel, m, to which is attached the receiving cylinder, B, having spiral flanges and longitudinal wings on both the internal and external surfaces, in combination with the stationary cylinder and trough, substantially as and for the purposes specified.

29,439.—Samuel Mills, of New York City, assignor to himself and F. Franck, of San Francisco, Cal., for an Improved Elevator and Lock for Window Sashes:

I claim the application and arrangement of the supporting guide, b, the rack, C, pinion, E, and stationary circular lock-plate, F, in combination with the spring crank handle and catch, by which the sash is elevated or depressed, and is safely secured in the position it is left from the hand, substantially as specified, for the purposes set forth.

29,440.—S. R. Plumb (assignor to the Peck Smith Manufacturing Company), of Southington, Conn., for an Improvement in Casting Cylinders for Meat-cutters:

I claim, first, Making a pattern having protuberances or projections extending to different points from the center, so as to withdraw the same from the mold while the hole is closed in the flask, by means of proper mechanism arranged within the pattern, substantially as set forth and described.

Second, I claim an improved manufacture of meat-cutter cylinders, &c., produced by means substantially such as set forth and described.

29,441.—Lyman Platt and Russel Wildman (assignors to themselves and J. S. Taylor), of Danbury, Conn., for an Improvement in Machinery for Forming Hat Bodies:

We claim, first, The forming of fur hats on the inner surface of an inverted perforated or wire cone suspended through a revolving ring into an exhaust chamber, in the manner specified.

Second, We also claim the combination of a picker, H, inverted perforated or wire cone, C, shield, K, and exhaust fan, E; the whole combined and operating as described, for the purpose as set forth.

Third, We also claim the expanding wire frame, constructed as described, for putting the lining within the formed hat, for the purpose described.

29,442.—O. W. Preston, Jr., and Wm. W. Farnham (assignors to themselves and Payne & Olcotts), of Corning, N. Y., for an Improvement in Straw and Stalk-cutters:

We claim, first, The employment or use, on a cutting wheel, C, of a straw and stalk-cutter of zig-zag ledges, h h, in connection with a slide bar, H, having a pawl, k, attached for the purpose of operating the feed rollers, I, substantially as set forth.

Second, Attaching the knives or cutters, E E, to a sliding bar, D, fitted to the wheel, C, in a way to be operated by the flanch, G, attached to frame, B, for the purpose of giving a drawing cut to the knives or cutters, substantially as described.

[This invention relates to certain improvements in that class of straw and stalk-cutters in which a rotary cutting wheel is employed. The invention consists in a novel feeding mechanism and a peculiar arrangement of the knives or cutters, whereby it is believed that the improvement is rendered more efficient than those of the same class hitherto constructed.]

29,443.—Reuben Shaler, of Madison, Conn., and C. B. Rogers, of Deep River, Conn., assignors to C. B. & J. Rogers, of Deep River aforesaid, and I. Champion, of Jersey City, N. J., for an Improved Foot-cleaner:

We claim the combination with a foot-scraper of the brushes, 4 4, or either of them, placed contingent to the ends or end of the scraper, upon axes or an axis placed crosswise of the line of the edge of the scraper, in such a manner that they or it may be rotated by the action of the foot in the operation of cleaning it, substantially as described.

29,444.—Thomas Shaw (assignor to himself and L. N. Brognard), of Philadelphia, Pa., for an Improved Feeding Apparatus for Steam Boilers:

I claim the arrangement of the body, A, chamber, B, disk, K, and lap, C, substantially as described, and the employment of the exhaust pipe, D, for the purpose specified.

29,445.—David Sherman, of Union Town, Md., and R. W. Fenwick, of Washington, D. C., assignors to D. Sherman and Bernard Mills, of said Union Town, for an Improved Churn:

We claim corrugating the surface of the nearly cylindrical churning chamber, diagonally or spirally, in the peculiar manner described, in combination with the blades, c c, of the dasher, which are set so as to stand across the diagonal or spiral corrugations, substantially as and for the purposes set forth.

29,446.—Joshua Turner, of Cambridgeport, Mass., assignor to himself and C. P. Hinds, of Boston, Mass., and Warren Tilton, of Beverly, Mass., for an Improved Oil-feeder:

I claim the improved flexible bottom oil-feeder, as made with the rod, D, extended from the flexible bottom and into and through the discharging pipe, C, substantially as specified.

29,447.—E. W. Tarbell (assignor to himself and E. A. Simonds), of Boston, Mass., for an Improved Steering Apparatus:

I claim the combination and arrangement of the two reversed screws, I I', and their lifting nuts, H H', supported in guide slots or their equivalents, with leading chains connected with the tiller, and with mechanism for simultaneously rotating the two screws by means of a hand wheel, as described.

29,448.—C. H. Willcox, of New York City, assignor to James Willcox, of Brooklyn, N. Y., for an Improvement in Sewing Machines:

I claim the method herein-described of securing the proper adjustment of the needle in the socket of its stock or holder, by means of an inner spline or locking-guide to the socket, in combination with a needle, grooved or slotted longitudinally at its shank, substantially in the manner and for the purposes set forth.

29,449.—C. M. Young (assignor to himself, E. H. Brown and E. Brown), of Sinclairsville, N. Y., for an Improvement in Stave-jointing Machines:

I claim the arrangement of the slide, F, curved rod, H, rod, I, and arms, J J, substantially as shown, to admit of the operating and the working of the planers, K, on the guides, L, at varying degrees of obliquity of the latter, for the purpose specified.

[The object of this invention is to obtain a machine by which staves may be jointed with a greater or less bilge, according to their width; or, in other words, have their edges cut with a greater or less degree of taper each way from their center outward, according to the bilge required; the latter being determined by the width of the stave—the wider the stave, the greater the taper, and vice versa.]

RE-ISSUES.

Hiram Aldridge, of Michigan City, Ind., for an Improved Shoe for Grain Separators. Patented May 24, 1859:

I claim, first, The combination and arrangement of an inclined lagged chaff and straw elevator, C I, primary inclined return sieve or board, F, and separator shoe, A, substantially as and for the purposes set forth.

Second, The combination of a secondary inclined extension tail or return board R, with the chaff elevator, C I, inclined sieve or primary return board, F, and separator shoe, A, substantially as and for the purposes set forth.

Third, The combination of an inclined lagged elevator, C I, with a separator shoe, A, when said elevator is placed in rear of and above the main cleaning sieve of the shoe in an inclined position, substantially as set forth.

Salmon Bidwell, of New York City (formerly of Chicago, Ill.), for an Improvement in Gas Regulators. Patented Sept. 21, 1858:

I claim a stop-cock, situated in, and controlling the passage-way from the gas-holder or other source of supply to the variable chamber, in combination with the moving part of the variable chamber, substantially as described.

J. A. Cutting and L. H. Bradford, of Boston, Mass., for an Improvement in Photo-lithography. Patented March 16, 1858:

We claim the employment of a solution of gum arabic sensitized by bi-chromate of potash, or its equivalent, in combination with the surface of a lithographic stone or plate of zinc, when acted upon by light, as a resistant to the effects of a solution of soap and application of printers' ink, for the purpose of combining the soap and ink with the stone or plate of zinc, as substantially set forth in the specification.

We also claim the employment of sugar, or its equivalent, in combination with gum arabic and bi-chromate of potash, in connection with a lithographic stone or plate of zinc, for the purpose of modifying the adhesive quality of the coating to the stone or zinc in the parts not acted upon by the light, in the manner as set forth in the specification.

We also claim the employment of a solution of soap, or its equivalent, for the purpose of forming the printing surface with the stone or plate of zinc, in combination with the sensitized gum arabic, to produce the positive photographic picture, in the manner as set forth in the specification.

Wm. H. Gilmore (assignee of James Emerson), of Worcester, Mass., for an Improvement in Ships' Windlasses. Patented April 17, 1855:

I claim the combination applied to each chain wheel, H, and the shaft, B, the same consisting of the part pinions, G G', the guard sectors, I I, the pawls, J J, the levers, K K, and the studs, h' h''; the whole being made to operate together and to be operated by the shaft, B, substantially in the manner and for the purpose as specified.

I also claim the combination and arrangement of the gears, C D N O, and their ratchet and pawl mechanisms, or equivalents therefor, applied to the two shafts, B E, substantially in the manner and for the purposes as specified.

I also claim the arrangement of the auxiliary capstan, F, with the main capstan, a, and its shaft, E, when the latter is connected with and made to operate another shaft, B, by gears, C D, as described.

G. P. Gordon, of New York City, for an Improvement in Printing Presses. Patented August 5, 1851; re-issued April 8, 1856:

I claim, first, A bed vibrating to and from the impression, in combination with a rocking platen, rocking to and from the impression, for the purposes set forth, substantially as described.

Second, I claim rocking the inking roller arms or frame upon a center, so that the inking rollers may pass and repass over the form of types for each and every impression, whether said rocking frame be constructed in the precise manner described or in some equivalent way to produce a like result.

Third, I claim the bearers, or their equivalents, in combination with the rocking inking roller arms or frame, for the purpose of passing and repassing the inking rollers over the type or form in a line parallel with the face of the type, when each rocking roller frame shall carry the inking rollers forward and backward over the type for each and every impression.

Fourth, I claim vibrating the bed from the point of its receiving the inking rollers to the point of impression, as described.

Fifth, I claim the rocking inking roller arms or frame, in combination with a vibrating bed, substantially as specified.

Sixth, I claim constructing a printing press with a rocking platen, so that the pressman, while feeding and driving the press, may stand directly in front of said press for such purpose, and be enabled, without changing his position, to see the face of such rocking platen as it rocks or turns towards him for the reception of the sheet to be printed; the face of the type or form, as it moves to and from the impression; the ink-distributing cylinder, or its equivalent, from its being placed at the top of the press; and the inking rollers when inking the type or form, thereby enabling said pressman to detect any imperfection in the working of these parts of the press; all substantially as set forth.

G. P. Gordon, of New York City, for an Improvement in Printing Presses. Patented August 5, 1851; re-issued April 8, 1856:

I claim, first, Supporting upon a center or centers, a platen which shall rock or turn between the point necessary for the reception of the impression and the point necessary for the reception of the sheet to be printed, when the face of such rocking platens shall stand out of a horizontal position, or at an angle from a horizontal position, at the time the impression is given, substantially as set forth and for the purposes described, whether the same be accomplished in the precise manner specified or in some equivalent way.

Second, I claim the frisket-grippers, or their equivalents, for relieving the sheet from the type, in combination with a rocking platen.

Third, I claim giving to a rocking platen, when receiving the sheet to be printed or when receiving the impression, a period of rest during the continued motion of the other parts of the press.

ADDITIONAL IMPROVEMENT.

A. P. Winslow, of Cleveland, Ohio, for an Improvement in Roofs for Railroad Cars. Patented August 9, 1859:

I claim the I-shaped piece of timber, C, in combination with the roof, constructed substantially as described, for the purpose of more readily renewing the roofs of cars which, having been used, require to be renewed.

DESIGNS.

Daniel Hathaway (assignor to Fuller, Warren & Co.), of Troy, N. Y., for a Design for a Six-plate Stove.

Daniel Hathaway (assignor to Fuller, Warren & Co.), of Troy, N. Y., for a Design for a Coal Stove.

D. L. Meincke, of St. Louis, Mo., for a Design for a Trade Mark.

B. S. Pardee, of Mount Carmel, Conn., for a Design for Hub Bands.

N. S. Vedder (assignor to Tibbits & McCoun), of Troy, N. Y., for a Design for a Cooking Stove.

N. K. Sanders, of New York City, and N. S. Vedder, of Troy, N. Y., assignors to A. K. Sanders, of said New York City, for a Design for a Cooking Range.

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W. W. Stanard (assignor to S. S. Jewett and F. B. Root), of Buffalo, N. Y., for a Design for a Cooking Stove (two cases).

W. W. Stanard (assignor to S. S. Jewett and F. B. Root), of Buffalo, N. Y., for a Design for a Parlor Stove.

NOTE.—In the foregoing list of claims, we recognize THIRTY-FIVE patents, or more than ONE-THIRD of the whole issue, which were solicited through this office.—EDS.

Notes and Queries

CORRESPONDENTS sending communications for publication in our columns are requested to avoid writing on both sides of a sheet of paper. This fault, though common to persons unaccustomed to writing for the press, gives great trouble to the printer (especially in long articles), and, when combined with illegibility of handwriting, often causes interesting contributions to be regretfully consigned to our waste-paper basket.

MECHANIC, of Mass.—The answer to your inquiry in the last number is entirely erroneous. The friction of large journals is greater than that of small journals.

SIMPSON & HOOKER, of New Berne, N. C., wish to know where they can obtain supplies of plow handles on the best terms.

ANGLICANUS, of ——.—Every printing office must have same standard for spelling, and we have adopted Webster. He gives the preference to center. It is true that this is immediately from the French, "centre," and Latin, "centrum;" but the primative root is the Greek verb, "centeo," to prick.

J. H., of Tenn.—We have no positive data in favor of the superiority of the tin-roofing to which you refer.

R. A. W., of Miss.—Your communication on boiler explosions contains a most excellent recommendation for safety, namely, "the feed pump ought always to be kept working." The same lesson you will find inculcated by us on page 194, Vol. I. (new series), of the SCIENTIFIC AMERICAN. The article on this subject, on the page referred to, has met the approval of every engineer with whom we have conversed.

S. S. R., of Tenn.—A gun barrel may be made of aluminum, but the present wholesale price in Europe is about $9 per pound, and it is less suitable for a gun barrel than steel or iron. Aluminum bronze, consisting of 90 parts of copper to 10 of aluminum, would make a better gun barrel in every respect than pure aluminum. The soldering of this metal has proved to be an exceedingly difficult process. We presume that Ball, Black & Co., of this city, keep it.

A McA. & Son, of N. Y.—Type metal is composed of 10 parts lead and 2 of antimony by weight. The antimony is added when the lead is melted. This should answer for your seals, if you are careful in casting it. Another composition for type-metal may suit your purpose better, as it expands when cooling. It consists of 9 parts lead, 2 of antimony and 1 of bismuth. Stereotype plates are formed of this alloy. Some persons employ tin as a substitute for the bismuth.

R. T., of Del.—It requires a certain amount of power to force air into a heated cylinder, because it exerts back pressure as its temperature increases. Air doubles its volume when heated to 491° Fah, and exerts a pressure of 15 lbs. on the square inch. A cast iron cylinder may be heated to 500° without injury. About 380 is a safe temperature to work hot air in a cylinder.

G. W., of Conn.—Common molding-sand, carefully sifted and mixed with one-fourth of its quantity of loam, is employed for brass molds. Old damp sand is preferred to fresh material, as it permits the patterns to be more easily removed from the molds. Fine flour is employed for facing the molds of common small articles; for the finest work, charcoal dust is employed. A fine face is sometimes given to molds by drying them over a slow fire of cork shavings, by which their surface receives a coating of smoke.

T. McG., Jr., of Ohio.—Enameled paper for cards is manufactured by L. I. Cohen, No. 184 William-street, this city, but the fancy enameled paper for pamphlet covers is mostly imported from Europe. We do not know a single factory in which it is made in this section of the country. The process of enameling is by friction-rubbing the surface of the paper with heated rolls.

S. C. S., of Mass.—We do not know where you can obtain a work for directing you in making cast letters of copper. This metal is very difficult to cast, because it is so pasty when in a molten state that it will not run into the cavities and sinuosities of molds. You should add some tin or zinc to it, if you wish a good casting.

W. T. B., of Mass.—We are perfectly agreed with you that the yellow substance that is frequently found on the top of cisterns and pools after showers of rain, and which is supposed to be sulphur, is vegetable pollen; we have noticed this fact at further length in another column.

C. F. B., of Vt.—Your communication is rather too much out of our line.

G. B., of Pa.—We shall be pleased to read your account of any facts which throw any light on vegetable physiology.

A. P., of N. Y.—"The same distance on each side of the meteor's track" is a typographical error. We wrote it "some distance," &c. Of course, it makes no difference whether the observers are the same distance or not, but the farther the better.

S. D. H., of Wis.—Heat is transmitted through a vacuum by radiation. A thermometer in vacuo would come to an equilibrium with the surrounding air, and would indicate its temperature.

H. C. B., of Mo.—So far as our personal experience goes, soldered tin roofs are not so liable to leak as those which are laid on in sheets, lapped over the edges; at the same time, much depends in both cases on the care taken to execute the work. Red lead and boiled linseed oil makes a good roofing paint for tin. A coating of fine white sand, dusted over fresh paint on a tin roof, serves the purpose of a partial non-conductor, to modify the action of solar heat, which tends to expand the joints of the tin plates.

E. N. J., of Conn.—Water can be heated up to 1,000°, and even above this heat, according to the pressure to which it is submitted. In a steam boiler the water is the same temperature as the steam, and ranges generally from 230° at 20½ lbs. pressure, and 320° at 88 lbs. pressure, and so on, according to the pressures. Water boils at quite a low temperature in a vacuum.

W. B. G., of N. Y.—We are not acquainted with any method of preparing paper for Bain's chemical telegraph, so that it may be used perfectly dried. When sponged slightly with some dilute glycerine, it will always remain moist for constant use. Blue and blanched marks can be produced on the same piece of paper with a current of electricity, sent first through an iron pen into the paper, then reversed and sent through a silver pointer. Black telegraphic characters can be produced on paper prepared with a solution of sumac or galls, by sending a current of electricity through an iron or steel pointer. The paper prepared for blue marks is treated with the prussiate of potash and a dilute nitric acid.

H. M. S., of N. Y.—The substance which you send us is hematite, one of the most valuable ores of iron.

W. F., of N. Y.—The necessity of a lightning-rod would not be materially increased by painting your tin roof. Hoop iron would make a good rod. Lead is a terrible poison, producing in many constitutions a train of frightful diseases—paralysis, neuralgia, colic, &c. The poison slowly accumulates in the system, and the diseases are almost absolutely incurable. Zinc paint is less injurious than lead paint.

B. H., of Cal.—To make a cheap filter for water, take a barrel with one head and bore the head full of gimlet holes; cover the bottom over these holes with a clean flanel, and pour in fine sand to the depth of six inches; fill with freshly burned charcoal to the depth of one or two feet, cover with a clean flannel and add weights to keep the contents in place. The sand and charcoal will require to be renewed occasionally.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, August 4, 1860:—

S. L. P., of N. Y., $55; C. A. R., of Ala., $30; T. S., of Cal., $100; J. W., of N. Y., $30; S. R. W., of R. I., $30; A. B. C., of Ga., $30: T. E. C. B., of Ky., $30; C. & M., of N. Y., $25; W. M. K., of N. Y., $25; J. H., of Ind., $25; A. W. J., of Conn., $25; J. L. G., of Ga., $30; C. H., of La., $82; J. F. F., of S. C., $25; G. W. & J. J. K., of Pa., $50; E. J. S., of N. Y., $30; J. B., of N. Y., $30; J. C., of La., $57; S. C. A., of Ark., $25; D. B., of Ill., $30; L. S. C., of N. Y., $55; J. H. S., of N. Y., $25; I. G., of Pa., $25; O. C., of Ill., $30; J. T. H., of Miss., $30; G. H., of Conn., $85; J. W. H., of N. C., $30; I. F., of Va., $30; Z. McD., of Ky., $20; C. H. B., of N. J., $10; E. A. P., of Mass., $30; G. B. M., of Mich., $25; J. & E., of Ill., $15; M. & B., of Miss., $55; B. & N., of Vt, $90; A. J. K., of Iowa, $28; J. K. B., of N. Y., $56; F. G., of Mich., $25; B. & B., of Ind., $30; E. G. P., of N. Y., $100; A. C., of Mass., $55; J. D. A., of Conn., $25; W. C., of Conn., $32; S. Y., of Ala., $25; O. P. A., of Mass., $25; H. O. & F. W. A., of La., $58; H. C. D., of Mich., $25; L. E., of Va., $75; G. W. S., of Conn., $30; J. S., of N. Y., $250; S. H., of L. I., $20; E. E., of Mass., $30; J. E., of Pa., $25; J. H., of Ind., $25; D. F., of Pa., $50; J. W. T., of Vt., $25; M. & L., of Mass., $25; M. A. R., of N. Y., $30; W. F. E., of Ohio, $30; T. B., of Conn., $20; T. H., of Cal., $75; R. G., Jr., of Fla., $30; C. L., of N. Y., $60; J. W., of N. Y., $25; and $50 by Adams & Co.'s express, for which an owner is wanted. The envelope containing the money is marked "Coatesville, Pa." Who sent it? The name of the sender is nowhere to be found on the envelope, and we have no letters in hand announcing the sending of such a parcel.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, August 4, 1860:—

L. S. C., of N. Y.; B. H., of N. Y.; I. G., of Pa.; J. H. S., of N. Y.; J. F. F., of S. C.; F. G., of Mich.; W. M. K., of N. Y.; J. E., of Pa.; G. B. M., of Mich.; E. A. P., of Mass.; J. Y., of Pa.: C. J., of N. Y. S. Y., of Ala.; J. W., of N. Y.; A. J. K., of Iowa; J. W. B., of N. Y. (two cases); B. & N., of La.; A. W. J., of Conn.; H. C. D., of Mich.; C. & M., of N. Y.; S. C. A., of Ark.; C. G., of La.; J. H. Y., of Ala. J. W. T., of Vt.; M. & L., of Mass.; C. H., of La. (two cases); J. H., of Ind.; McN. & L., of N. Y., J. D. A., of Conn.

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PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within 14 years, can obtain a copy by addressing a note to this office, stating the name of the patentee, and date of patent, when known, and enclosing $1 as fee for copying.

INVENTORS SENDING MODELS to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies either, through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them!

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THIRTY CENTS per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement sent for publication.

IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, are happy to announce the engagement of HON. CHARLES MASON, formerly Commissioner of Patents, as associate counsel with them in the prosecution of their extensive patent business. This connection renders their facilities still more ample than they have ever previously been for procuring Letters Patent, and attending to the various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c., &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, extending over a period of fifteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at their office.

They are very extensively engaged in the preparation and seeuring of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London; 29 Boulevard St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

A pamphlet of information concerning the proper course to be pursued in obtaining patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office or either of the Branches. They also furnish a Circular of Information about Foreign Patents.

The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Patents:—

Messrs. MUNN & Co.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE CAME THROUGH YOUR HANDS. I have no doubt that the public confidence thus indicated has been fully deserved as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers. Yours, very truly,

CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

Messrs. MUNN & Co.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your duties of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements. Very respectfully,

Your obedient servant, J. HOLT.

Messrs. MUNN & Co.:—Gentlemen: It gives me much pleasure to say that, during the time of my holding the office of Commissioner of Patents, a very large proportion of the business of inventors before the Patent Office was transacted through your agency, and that I have ever found you faithful and devoted to the interests of your clients, as well as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP

Communications and remittances should be addressed to

MUNN & CO.,
Publishers, No. 37 Park-row, New York.

LABORATORY OF CHEMISTRY.—PROFESSOR H. DUSSANCE, chemist (from the Conservatoire Imperial of Arts and Manufactures, Paris), gives consultations on chemistry applied to agriculture, metallurgy, arts and manufactures. Information on chemical fabrications, such as india-rubber, gutta-percha, acids, alkalies, salts, glass, pottery, colors of lead and zinc, sugars, distillation, vinegar, paper, matches, lighting, heating by gas, coal oil, candles (common, refined), French soaps, oils, varnishes, lakes, calico printing, dyeing, perfumery, animal black, natural and artificial manures, mining surveys, commercial essays, &c. Address, New Lebanon, N. Y. 1*

PATENT DOUBLE-ACTION SUCTION SHIP PUMP.—Patented at Quebec, C. E., by John Brokenshire, of Bowmanville, C.W., March 27, 1860.—The novel features of this pump consist in having a double bore in the same stick; in having two pistons to cause a double action in the same pump; in the combination of three valves, so that one piston has no control over the other, while the double valves are in order; in the bore-connector, by which the bores can be connected and the safety valve inserted with ease; and in the plate and screws for covering the same. These principles are claimed as new, either in wood or Iron. Address, JOHN BROKENSHIRE, Bowmanville, C.W. 1*

THE WEAVER'S GUIDE.—TWO HUNDRED samples of ground weaving, from 2 to 16 harness, accompanied by drawings and explanations; by E. Kellermann. Prices: one copy, $5; two copies, $9; three copies, $13; four copies, $16. On receipt of the amount stated, copies will be sent without delay. All orders promptly attended to. 1* E. KELLERMANN, Moosup, Conn.

STOVER MACHINE COMPANY, NO. 13 PLATT-street, New York—Manufacturers of Stover's Patent Eagle Molding Machine, for cutting and planing irregular forms of every description—illustrated in No. 25, Vol. I., SCIENTIFIC AMERICAN—and of the Stover & Coffin Patent Combination Planing Machine—illustrated in No. 19, Vol. II., SCIENTIFIC AMERICAN. Also, all kinds of Wood and Iron labor-saving machinery, Railroad Supplies, &c. &c. 1*

A SMITH OF STEADY HABITS, AND WITH experience in forging and tool-dressing for a machine shop of general work, desires a steady situation, in a healthy location, at $2 25 per day. Refers to REUBEN NICKERSON, agent, Athens, Ga. 7 2*

THE EIGHTEENTH EXHIBITION OF ARTS and Manufactures, under the direction of the Ohio Mechanics' Institute, will open in Cincinnati on Monday, Sept. 10th, and continue open four weeks. The premiums will consist of more than 100 gold and silver medals, &c. Send for circular. 7 5*

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THE GRAEFENBERG THEORY AND PRACTICE OF MEDICINE.—On the 1st day of May, 1860, the Graefenberg Company's Sales-rooms, Consulting Offices and Medical Institute were removed from No. 34 Park-row to—
No. 2 Bond-street, New York,
(first door from Broadway,) in order to afford greater facilities and a more central location, demanded by the rapid increase of confidence in the Graefenberg Theory and Practice. The Graefenberg Theory and Practice, and the use of their medicines, together with complete symptoms of all diseases incident to this country and climate, the best method for their prevention and cure, will be found in the "Graefenberg Manual of Health."
This valuable family medical work, containing 300 pages, has been revised and improved, and elegantly illustrated with beautifully colored engravings of the human system. Sent by mail to any part of the country, on receipt of 25 cents. It is a complete guide to all diseases and their cure. Address
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One of the leading journals says of the Graefenberg Manual of Health :—"This is the only medical book for family and general use ever published. It is written in plain language, free from scientific terms, and condenses more practical medical information than can be obtained anywhere else, unless a regular medical course of education is undergone. The popularity of this admirable and compendious work is well shown by this being the twenty-fourth edition. It contains a number of colored anatomical plates, and is a complete family physician. It is at once simple, popular, plain and explicit; and the mother, with such an adviser, is prepared at once to apply the proper remedies in case of sudden sickness in the family. In the country, a copy of the 'Manual of Health' is indispensable, and every family should possess one. It will save a hundred times its cost in doctors' bills, and, what is far better, will be the means of preserving many valuable lives to their families and relatives."
leowtf

WHEELER & WILSON MANUFACTURING Company Sewing Machines. Office, No. 505 Broadway, New York. Send for a pamphlet. 5 8*

FOR SALE—TWO LARGE TRIP HAMMERS; one new and one second-hand (as good as new). For full description see advertisement in SCIENTIFIC AMERICAN.
3 12* J. C. HOADLEY, Lawrence, Mass.

FOR SALE—A STATIONARY STEAM ENGINE, 7x15, 10-horse power, with boiler and all appurtenances; has been in use three months; in perfect order. An excellent engine. Particulars on application. J. C. HOADLEY, Lawrence, Mass.
3 13*

FOR SALE—A DOUBLE HORIZONTAL STEAM engine, 18x36, 100-horse power; has been in use one year; in perfect order. Three boilers and all appurtenances. Particulars on application. [3 13*] J. C. HOADLEY, Lawrence, Mass.

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MODELS—IN EITHER WOOD OR METAL, for the Patent Office. HENRY J. BEHRENS,
3 5* No. 170 Chatham-street, in the rear.

MACHINERY.—S. C. HILLS, NO. 12 PLATT streets, New York, dealer in Steam-engines, Boilers, Planers Lathes, Chucks, Drills, Pumps; Mortising, Tenoning and Sash Machines, Woodworth's and Daniel's Planers, Dick's Punches, Presses and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c. 2 e3w

TO CHAIR, CABINET-MAKERS AND BOAT-BUILDERS.—Rights to use Blanchard's patent in the States of New York, New Jersey, Pennsylvania and Maryland, for sale by the Phœnix Wood-bending Company. JOHN SILSBY, Agent,
6 4* No. 34 Broadway, New York, up stairs.

$1.000.—THE ABOVE AMOUNT IS wanted to perfect and patent an automatic steering apparatus, for which I will allow one half of the interest. For further particulars, address ROBERT ROSS, St. Albans. Vt.
7 2*

BARREL HEAD-CUTTERS, PLANERS AND wheel-jointers for sale at the Greenwood Patent Barrel Machine Works, Rochester, N. Y. [7 8*] JNO. GREENWOOD.

A NEW INVENTION WANTED.—A MACHINE for dipping "fire-kindlers" with match paste. Address, Mrs. LAWRENCE BELLINGER, Mohawk, Herkimer county, N. Y. 1*

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STATE AND COUNTY RIGHTS OF J. H. Gooch's universal plow for sale. See illustration and description on page 406, Vol. II. (new series), of the SCIENTIFIC AMERICAN. For further information, address the inventor, J. H. GOOCH, Oxford, N. C. 7 5*

TO CAPITALISTS.—A VALUABLE PATENT for sale. Granted Feb. 14, 1860. Address, for particulars, E. KELLERMANN, patentee, Moosup, Conn. 1*

STEAM AND WATER GAGES, GLASS TUBES, Indicators, &c., constantly on hand at maker's prices. E. BROWN, No. 311 Walnut-street, Philadelphia, Pa. 7 3*

J. A. FAY & CO., WORCESTER, MASS., MAKE the iron frame Bay State planer and matcher; it has a wrought iron head, steel bearings, Fitt's patent knife-adjuster and feed works. Will surface 24 inches wide. Send for circulars. 7 2*

SCRUBBING BRUSHES, FLESH BRUSHES, Hand Brushes, Nail Brushes, &c.—For a good valuable article, see illustration on page 400, last volume of the SCIENTIFIC AMERICAN.
2 3

WARREN'S TURBINE WATER WHEEL (Warren & Damon's patent), manufactured by the American Water Wheel Company, Boston.—This Wheel stands at the head for great economy in water. Over 600 are now operating with great success in cotton and woolen factories, &c., &c. With its modern improvements, it cannot be surpassed. Send for our 7th annual pamphlet of 1860 (inclose two stamps), containing a treatise on hydraulics, beautiful illustrations of the Warren Turbine, practical rules for computing water-power, prices, &c., &c. It is the Wheel for the North, because ice does not affect it; for the South, because it is compact and ready to attach and operate without great mechanical skill; for the world, because it generates more available power from the water used than any other Water Wheel in existence. Address A. WARREN, Agent, No. 31 Exchange-street, Boston, Mass.
2 6*

INVENTORS' DEPOT AND SALESROOMS FOR Patent Rights, No. 30 Broadway, New York.—Patents possessing positive merits—and such only—have, in this depot, their headquarters, where they can be properly introduced to public notice and find purchasers. Constant opportunities for judicious and profitable investments in patents, embracing all departments in life, can here be found by parties of liberal as well as of limited means. Citizens and strangers, all, can find something to interest and profit them, and they are cordially invited to call at our depot; the latch-string being out. Circulars, descriptive of the objects of the agency, can be had on application. BUTLER, HOSFORD & CO.
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WOODWORTH PLANING MACHINES FROM $80 to $150.—Sash-molding, tenoning and mortising machines at low prices. For sale at the Philadelphia Machinery Depot, No. 135 North Third-street. [1 13*] CHAS. H. SMITH.

VALUABLE IMPROVEMENT IN PROPELLER Ships—Patented March 27, 1860. For engraving and description, see SCIENTIFIC AMERICAN, Vol. II., No. 23 (June 2, 1860). The use of this patent right may be had, on very liberal terms, by an arrangement with the patentee. Address H. W. HERBERT, Norfolk, Va. 6 4*

SOME THREE OR FOUR MECHANICS OR Sawyers, wishing a healthy, well-timbered and never-failing water-power for Sawmills, in a good locality, may address J. B. MUNSY or J. A. McCALLON, Roaring River P. O., Barry county, Mo. 6 2*

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BURNHAM'S IMPROVED JOUVAL TURBINE water wheel (patented Feb. 22, 1859) and mill gearing of the latest improved patterns. Manufactured by N. F. BURNHAM, Variety Iron-works, York, Pa. 1 13*

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PORTABLE STEAM ENGINES, COMBINING the maximum of efficiency, durability and economy with the minimum of weight and price. They received the large gold medal of the American Institute, at their late fair, as "the best Portable Steam Engine." Descriptive circulars sent on application. Address J. C. HOADLEY, Lawrence, Mass. 1 22*

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Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu adressiren an

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C. L. GODDARD, AGENT, NO. 3 BOWLING Green, New York. Only Manufacturer of the Steel Ring and Solid Packing Burring Machines and Feed Rolls for Wool Cards, &c.
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BURNELL'S PATENT ROTARY PUMP—adapted to all purposes of pumping, from the well and cistern to the steam fire-engine. The most simple, durable and efficient pump yet made. Principal sales depot at No. 23 Platt-street, New York. [1 13*] SAMUEL B. LEACH.

PORTER'S CENTRIFUGAL GOVERNOR.—THE attention of parties troubled with irregular or unsteady power is respectfully called to this Governor, now coming into general use. It may be used in connection with any valve or cut-off, and will regulate the motion of the engine so perfectly that its entire load may be thrown on or off at once, without sensibly affecting its speed. I will send a Governor to any responsible person for trial; and if its action is not perfect under the above test, it may be returned. Prices exceedingly moderate. All orders and communications will receive prompt attention. Send for a circular.
Address CHAS. T. PORTER, 235 West Thirteenth-street, corner of Ninth-avenue, New York. A few reliable agents wanted.
1 tf.

MACHINISTS, &C.—INVENTORS' MODELS made by STOCKMAR & BAADE, No. 39 Greene-street, near Grand, New York City. 1 12*

TO MANUFACTURERS AND WHOM IT MAY concern.—We deem Conant's Loom Warp Motion (as represented in the SCIENTIFIC AMERICAN of June 23, 1860) a clear infringement on Letters Patent granted to Snell & Bartlett's additional improvement, dated Sept. 1, 1857. Said patent having been assigned to us, parties building, selling or using the same will take notice, and govern themselves accordingly. E. D. & G. DRAPER.
6 2*

GRAY & WOODS' PATENT IMPROVED Planer; a combination of the Woodworth and Daniels' planers, particularly adapted for shop work, and for which we have obtained three patents and six medals. (See description and illustration in No. 6, Volume II., SCIENTIFIC AMERICAN.) Also, for sale, all kinds of wood-working machinery. Send for a circular. Address GRAY & WOODS, No. 69 Sudbury-street, Boston, Mass. 1 tf

FAN-BLOWERS—OF VARIOUS SIZES AND kinds, for smiths' fires and foundries, for sale by SAMUEL B. LEACH, No. 23 Platt-street, New York. 1 11*

A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise et qui prefereraient nous communiquer leurs inventions en Francais peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence.
MUNN & CO., Scientific American Office, No. 37 Park-row, New York.

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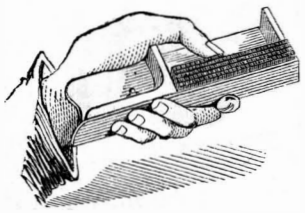
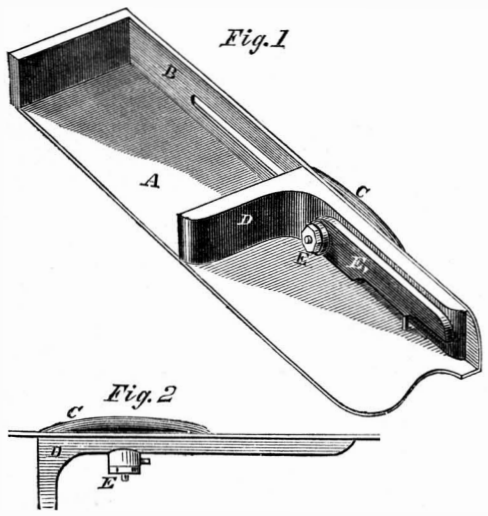
IMPROVED PRINTERS' COMPOSING STICK.



THE accompanying engraving represents an improvement in printers' composing sticks—the apparatus for organizing into rank and file those little leaden soldiers which, in this civilized age, are the rulers of the world. It was invented by Stephen W. Brown, of Syracuse, N. Y., and is pronounced by the practical printers in our office a decided improvement; being very promptly adjusted to any width of column, and smooth and easy to the hand.

As will be seen by examining the cut, the slit for moving the slide is made in the side piece, B, of the stationary part, A, of the stick. Below the side piece, B, is the curved spring plate, C, to which is secured the small bolt that passes through the slit and through the slide, D, and has the nut, E, upon its end. Interposed between the slide and the nut is the lever, E′, which has a projection upon its inner side, so arranged that when the lever is turned down (in the position shown), the projection forces the lever outward against the nut, and thus presses the slide firmly against the side piece, B,



of the stationary part of the stick. By turning the lever upward, the projection is carried away from contact with the side of the slide, by which the latter is relieved from its pressure, and may then be removed to any position to adapt it to the width of the column required.

It will be seen that this admits a very easy and prompt adjustment of the slide, and that there is no large screw-head in the way to interfere with the hand in holding the stick.

The patent covers a modification of the plan described, which consists in so hinging the lever as to have it turn at right angles to the motion here illustrated; the pressure then being exerted by a curved projection eccentric to the fulcrum pin.

The patent for this invention was procured (through the Scientific American Patent Agency), on May 22, 1860; and further information in relation to it may be obtained by addressing Joel McComber, at Watertown, N. Y.

RAINING SNAKES.

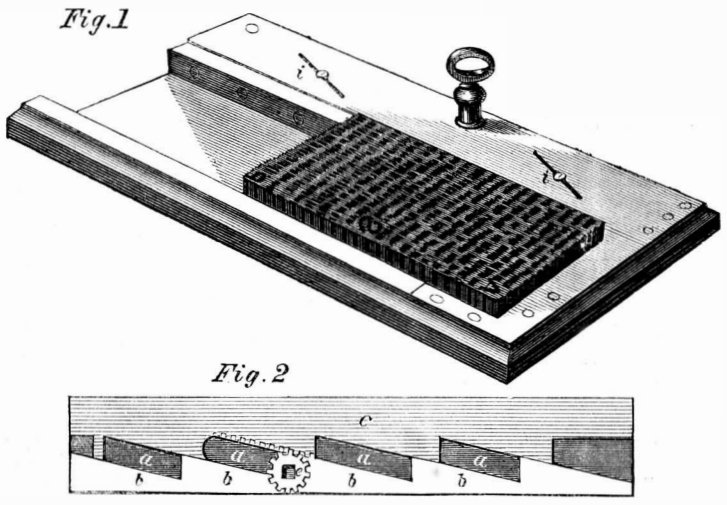
MESSRS. EDITORS:—During the very heavy shower of rain which fell here on the evening of July 3d, about sundown, while I was standing upon a flat rock, I heard a peculiar noise at my feet, and, on looking down, I saw a snake lying as if stunned by a fall from an immense hight. On commencing an examination, the snake began to show signs of life, which I soon ended by a blow on the head. The animal was about a foot long, and of a gray color. I had previously heard of similar occurrences, but now, judging from occular demonstration, I verily believe that his "snakeship" had never before seen South Granville, or, indeed, any other part of *terra-firma*. Will you or some of your correspondents suggest a plausible theory for this phenomenon?

WM. RUGGLES.

South Granville, N. Y., August 6, 1860.

IMPROVED PRINTERS' GALLEY.

In connection with the above-described composing stick, we present an illustration of an improved galley for holding type, by the same inventor. This also is considered in our office, especially by the foreman who has tried it, to be an improvement, rendering the wedging up of the type much easier and quicker than by the old method.



BROWN'S IMPROVED PRINTERS' GALLEY.

It is essentially an improved plan for forcing the movable ledge against the type and holding it there. In the movable stick, C, are cut a series of inclined notches, *a a a a*, and a series of corresponding notches, *b b b b*, are made in the stationary part of the apparatus, so that when the stick, C, is pushed along endwise, these notches operate as wedges to force it sideways against the type. This longitudinal motion is effected by turning the pinion, *e*, by means of a key, a rack being made along one of the notches as shown. For drawing the movable stick back when it is carried longitudinally in the opposite direction, the screws, *i i*, are inserted in its side and passed through the diagonal slits in the covering plate. The key is removable so as to be withdrawn when it is desired to take a "proof."

An application for a patent for this invention is now pending before the Patent Office, and further information in relation to it may be obtained by addressing Joel McComber, at Watertown, N. Y.

A PLAN FOR DRAWING CANAL BOATS BY LOCOMOTIVES.

MESSRS. EDITORS:—The idea of combining a railroad and a canal may be old and unsuccessfully tried, but as I am not aware of the fact, I venture this communication to your valuable and interesting paper.

I propose laying a track on the tow-paths of canals and pulling the boats by locomotive engines, which might be owned by the canal company, a certain number passing each way daily, on schedule time; the boats might be private property, paying increased tolls for motive power. Single boats could be picked-up or dropped by a *train* of passing boats, with the utmost ease and dispatch, and the number of boats that could be drawn by a single locomotive would be very great. Connections might be effected by attaching each boat to a cable or by coupling the boats together. The most profitable rate of speed for freight would have to be established by trial, though it would probably be considerably greater than the present; but passenger and quick freight boats for lighter and more valuable merchandise could be run as fast as the abrasion of the water on the banks would admit, which, of course, would depend on the width and depth of the channel.

Canals operated in the above-described way would be vastly increased in capacity for business, not only from greater quickness of transportation, but because boats consolidated into trains occupy less space and are less in each other's way; in other words, this plan of propulsion converts a promiscuous crowd into a well-disciplined army. The cost of the rail tracks would be small, in comparison to those of ordinary railroads, for grading is already done, and the lightest possible superstructures would last a long time where rates of speed were so low, and the rolling stock reduced to locomotives alone. From the same causes current expenses and loss by casualties would be small. Grades would be composed of levels, with inclined planes at the locks; the engines performing the heavy draught of the former and passing up the latter with their own weight alone.

WM. W. BLACKFORD.

Saltville, Va., August 1, 1860.

[We suggested the adoption of this method of canal commerce on page 299, Vol. XIII. (old series) of the SCIENTIFIC AMERICAN, and we again commend it to public attention.—EDS.

BLACK HAWK THE BEST ROADSTER.—At the agricultural show at St. Louis, Mo., last Fall, $1,000 was offered as a premium for the best roadster stallion. The judges from the great number offered selected six which were deemed the best, and then made a critical examination of them to find the best *one*. Of these six, five were sons of "Black Hawk," and the sixth a grandson. "Stockbridge Chief," bred in Massachusetts and now owned in Ohio, won the premium.—*American Stock Journal.*

THE "GREAT EASTERN" ON ANOTHER EXCURSION.—The day after the *Great Eastern* returned from Cape May, she started on another excursion to Annapolis, Md., where she is to take coal for her return trip to England. She is advertised to sail for Liverpool on the 16th inst. A very marked contrast was observed between the sailing of this marine monster on Thursday, the 2d inst., and Monday the 30th ult. On the second occasion there were no steamers to accompany her down the bay, no crowds on the roofs and house-tops to witness the mammoth steamer as she sailed down the river, with scarcely a hundred passengers on board.

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To the Inventor and Patentee it is invaluable as the only reliable record of the progress of invention, at home and abroad, and of the weekly issues of American patents. No person interested in these matters, or who is engaged in mechanical pursuits should think of "getting along" without the weekly visits of this journal. The publishers invite attention to the extraordinarily low price at which it is furnished, making altogether the most valuable as well as the cheapest paper of the kind in the world.

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